DVP-F11

RMT-D109E/D109O

SERVICE MANUAL

AEP Model
UK Model
E Model
Hong Kong Model
Singapore Model
Australian Model

Self Diagnosis Supported model

SPECIFICATIONS

CD/DVD player

Laser Semiconductor laser
Signal format system PAL/(NTSC)

Audio characteristics

Frequency response DVD (PCM 96 kHz): 2 Hz to 44 kHz (±1 dB)*
DVD (PCM 48 kHz): 2 Hz to 22 kHz (±0.5 dB)
CD: 2 Hz to 20 kHz (±0.5 dB)
Signal-to-noise ratio More than 110 dB (LINE OUT (AUDIO) connectors only)
Harmonic distortion Less than 0.0025%
Dynamic range More than 100 dB (DVD)
More than 98 dB (CD)
Wow and flutter Less than detected value (±0.001% W PEAK)

Outputs and inputs

	Jack type	Output level	Load impedance
LINE OUT (AUDIO)	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
OPTICAL	Optical output connector	–18 dBm	Wave length: 660 nm
COAXIAL	Phono jack	0.5 Vp-p	75 ohms terminated
LINE OUT (VIDEO)	Phono jacks	1.0 Vp-p	75 ohms, sync negative
LINE OUT (S-VIDEO)	4-pin mini DIN	Y: 1.0 Vp-p C: 0.3 Vp-p (PAL) 0.286 Vp-p (NTSC)	75 ohms, sync negative 75 ohms terminated
LINE OUT (WOOFER OUT)	Phono jacks	2 Vrms	Over 10 kilohms
PHONES	Phone jack	12 mW	32 ohms

General

Power requirements DC 10.5 V
Power consumption 13 W
Dimensions (approx.) 215 × 60 × 314 mm (w/h/d) incl. projecting parts
Mass (approx.) 2.1 kg
Operating temperature 5°C to 35°C
Operating humidity 25% to 80%

AC power adaptor

Power requirements 220–240 V AC, 50/60 Hz
Power consumption 19 W
Output voltage DC OUT 10.5 V, 1.3 A in operating mode
Dimensions (approx.) 125 × 39 × 62 mm (w/h/d) excl. projecting parts
Mass (approx.) 235 g
Operating temperature 5°C to 35°C
Storage temperature –20°C to +60°C

Supplied accessories

- Audio/Video connecting cord (1)
- S video cord (1)
- AC power adaptor AC-F11 (1)
- AC power cord (1)
- Remote commander (remote) RMT-D109O (1) (Except Hong Kong and Singapore)
  Remote commander (remote) RMT-D109E (1) (Hong Kong and Singapore)
- Size AA (R6) batteries (2)
- Stand (1)
- EURO AV adaptor (1) (Except Hong Kong, Singapore and Australian)

* The signals from LINE OUT (AUDIO) connectors are measured. When you play the PCM sound tracks with 96 kHz sampling frequency, the output signals from the OPTICAL and COAXIAL connectors are converted to 48 kHz (sampling frequency).

Design and specifications are subject to change without notice.

DVD VIDEO COMPACT disc DIGITAL VIDEO **CD/DVD PLAYER**

MICROFILM

SONY®

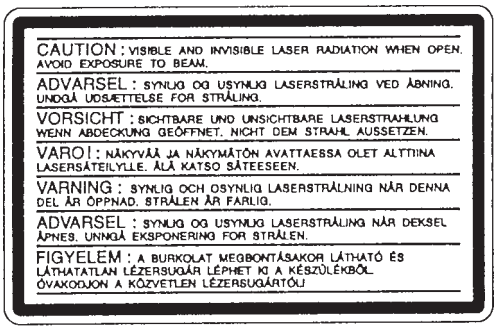
http://getMANUAL.com

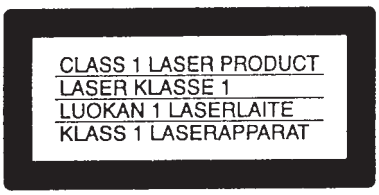
WARNING!!

WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:
The use of optical instrument with this product will increase eye hazard.

CAUTION
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.


CAUTION : VISIBLE AND INVISIBLE LASER RADIATION WHEN OPEN. AVOID EXPOSURE TO BEAM.
ADVARSEL : SYNLIG OG USYNLIG LASERSTRÅLING VED ÅBNING. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT : SICHTBARE UND UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFNET. NICHT DEM STRAHL AUSSETZEN.
VARO ! : NÄKYVÄÄ JA NÄKYMÄTÖN AVATTAESSA OLET ALTTIINA LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.
VARNING : SYNLIG OCH OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD. STRÅLEN ÄR FARLIG.
ADVARSEL : SYNLIG OG USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES. UNNGÅ EKSPONERING FOR STRÅLEN.
FIGYELEM : A BURKOLAT MEGBONTÁSAKOR LÁTHATÓ ÉS LÁTHATATLAN LÉZERSUGÁR LÉPHET KI A KÉSZÜLÉKBÖL. ÓVAKODJON A KÖZVETLEN LÉZERSUGÁRTÓL!



CLASS 3B LASER
LUOKAN 3B LASER
LASERKLASS 3B

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are “pinched” or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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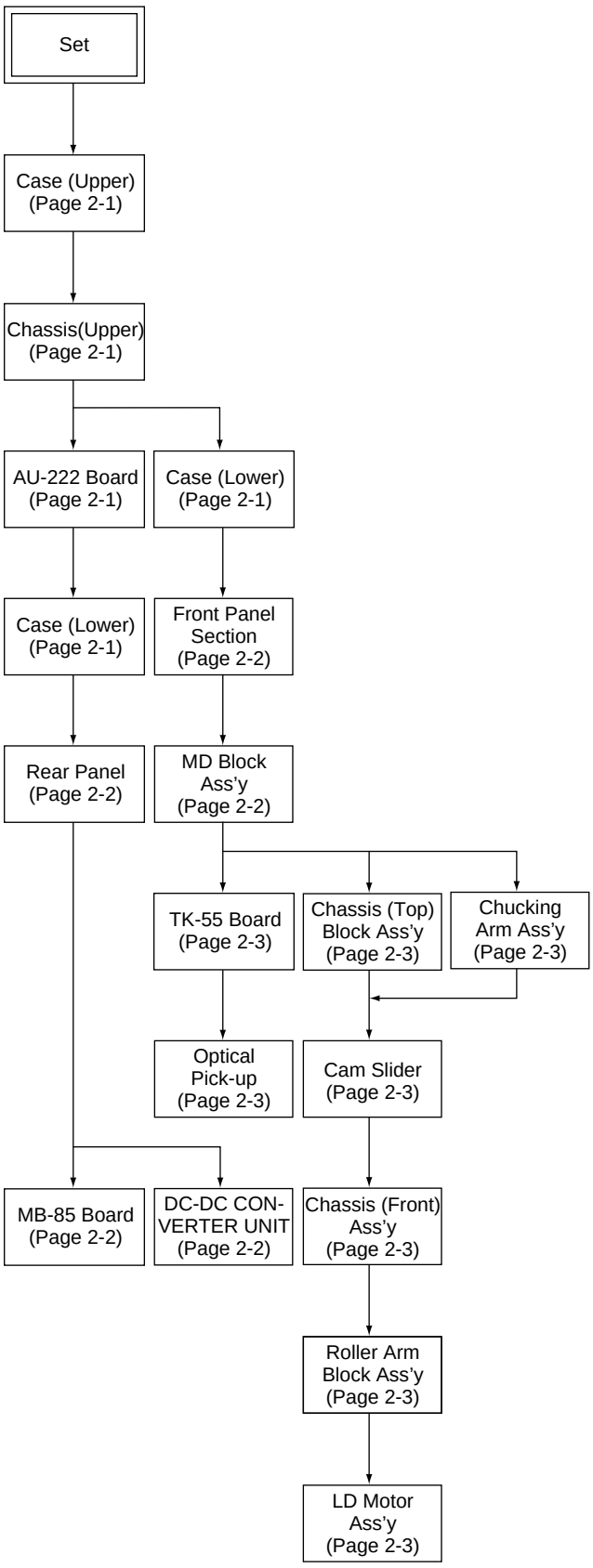
SERVICE NOTE

1. DISASSEMBLY

• This set can be disassembled in the order shown below.


Set
Case (Upper) (Page 2-1)
Chassis(Upper) (Page 2-1)
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Case (Lower) (Page 2-1)
Case (Lower) (Page 2-1)
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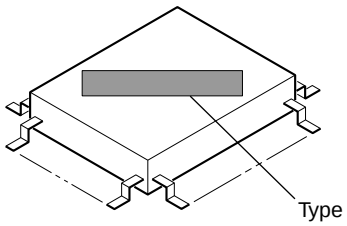
DC-DC CON-VERTER UNIT (Page 2-2)
Chassis (Front) Ass'y (Page 2-3)
Roller Arm Block Ass'y (Page 2-3)
LD Motor Ass'y (Page 2-3)

Note on Replacing IC601 (IF CON) (FL-111 Board)

There are two types of IC601 (IF CON).

Version	Type (Part No.)
Ver. 1.00	M38B57MCH-E227FP (8-759-599-87)
Ver. 1.01	M38B57MCH-D233FP (8-759-658-36)

• Version checking method



When replacing the IC601, always check the version of old part and new part. If different, follow the "description of replacement" given below.

Old part (Ver.)	New part (Ver.)	Description of replacement
1.00	1.00	Replace as it is. (However, for the CED Model (serial No. 800001-800100), also replace the resistor R659 47 k (1-216-089-00) with 1.5 k (1-216-053-00), and further remove the resistors R653, 654, 661, 662, 663, 664.)
	1.01	Replace as it is. (However, for the CED Model (serial No. 800001-800100), also remove the resistors R653, 654, 661, 662, 663, 664.)
1.01	1.00	Also, replace resistor R659 47 k (1-216-089-00) with 1.5 k (1-216-053-00).
	1.01	Replace as it is.

SECTION 1
GENERAL

This section is extracted from instruction manual (3-867-780-11).

About This Manual

Conventions

- Instructions in this manual describe the controls on the player. You can also use the controls on the remote if they have the same or similar names as those on the player.
- The icons on the right are used in this manual:

Icon	Meaning
	Indicates that you can use only the remote to do the task.
	Indicates tips and hints for making the task easier.
DVD	Indicates the functions for DVD VIDEOs.
VIDEO CD	Indicates the functions for VIDEO CDs.
CD	Indicates the functions for Audio CDs.

This Player Can Play the Following Discs

	DVD VIDEOs		VIDEO CDs		Audio CDs	
Disc logo	DVD VIDEO		COMPACT disc DIGITAL VIDEO		COMPACT disc DIGITAL AUDIO TEXT	
Contents	Audio + Video		Audio + Video		Audio	
Disc size	12 cm	8 cm	12 cm	8 cm	12 cm	8 cm (CD single)
Play time	About 4 h (for single-sided DVD)/ about 8 h (for double-sided DVD)	About 80 min. (for single-sided DVD)/ about 160 min. (for double-sided DVD)	74 min.	20 min.	74 min.	20 min.

"DVD VIDEO" logo is a trademark.

When you play an NTSC disc, this player outputs the video signal in the NTSC system only. In this case, if your TV is a PAL system mode, the picture becomes noisy.

Region code of DVDs you can play on this unit

Your DVD player has a region code printed on the back of the unit and will only play DVDs that are labeled with identical region codes.

DVDs labeled ALL will be also played on this unit.

If you try to play any other DVD, the message "Playing this disc prohibited by area limits." will appear on the TV screen.

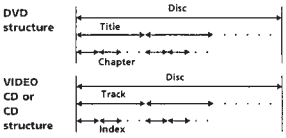
Depending on the DVD, no region code indication may be labeled even though playing the DVD is prohibited by the area limits.

Note on playback operations of DVDs and VIDEO CDs

Some playback operations of DVDs and VIDEO CDs may be intentionally fixed by software producers. Since this player plays DVDs and VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. Also refer to the instructions supplied with the DVDs or VIDEO CDs.

Terms for discs

- Title
  The longest sections of a picture or a music piece on a DVD; a movie, etc., for a picture piece on a video software; or an album, etc., for a music piece on an audio software. Each title is assigned a title number enabling you to locate the title you want.
- Chapter
  Sections of a picture or a music piece that are smaller than titles. A title is composed of several chapters. Each chapter is assigned a chapter number enabling you to locate the chapter you want. Depending on the disc, no chapters may be recorded.
- Track
  Sections of a picture or a music piece on a VIDEO CD or a CD. Each track is assigned a track number enabling you to locate the track you want.



- Index (CD) / Video Index (VIDEO CD)
  A number that divides a track into sections to easily locate the point you want on a VIDEO CD or a CD. Depending on the disc, no indexes may be recorded.
- Scene
  On a VIDEO CD with PBC functions, the menu screens, moving pictures and still pictures are divided into sections called "scenes." Each scene is assigned a scene number enabling you to locate the scene you want.

Note on PBC (Playback Control) (VIDEO CDs)

This player conforms to Ver. 1.1 and Ver. 2.0 of VIDEO CD standards. You can enjoy two kinds of playback according to the disc type.

Disc type	You can
VIDEO CDs without PBC functions (Ver. 1.1 discs)	Enjoy video playback (moving pictures) as well as music.
VIDEO CDs with PBC functions (Ver. 2.0 discs)	Play interactive software using menu screens displayed on the TV screen (PBC Playback), in addition to the video playback functions of Ver 1.1 discs. Moreover, you can play high-resolution still pictures, if they are included on the disc.

Discs that the player cannot play

The player cannot play discs other than the ones listed in the table on page 4. CD-R, CD-ROMs including PHOTO CDs, data sections in CD-EXTRAs, DVD-ROMs, DVD-Audio, HD (high density) layer of "Super Audio CD," etc., cannot be played.

When playing DTS*-encoded CDs, excessive noise will be heard from the analog stereo outputs. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo outputs of the DVD player are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external 5.1-channel DTS Digital Surround™ decoder system must be connected to the digital output of the DVD player.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

* "DTS" is a trademark of Digital Theater Systems, Inc.

Precautions

On safety

- Caution – The use of optical instruments with this product will increase eye hazard.
- Should any solid object or liquid fall into the cabinet, unplug the player and have it checked by qualified personnel before operating it any further.
- Do not put any foreign objects in the DC IN 10.5 V (external power input) jack.

On AC power adaptor and AC power cord

- Use only the supplied AC power adaptor. Do not use any other AC power adaptor. It may cause a malfunction.

Polarity of the plug

- If the AC power adaptor causes interference to the radio reception, move it away from the radio.
- Do not touch the AC power adaptor with wet hands.
- The player is not disconnected from the AC power source (mains) as long as it is connected to the wall outlet, even if the player itself has been turned off.
- If you are not going to use the player for a long time, be sure to disconnect the player from the wall outlet. To disconnect the AC power cord (mains lead), grasp the plug itself; never pull the cord.
- Should the AC power cord (mains lead) need to be changed, have it done at a qualified service shop only.

On placement

- Place the player in a location with adequate ventilation to prevent heat build-up in the player.
- Do not place the player and the AC power adaptor on a soft surface such as a rug that might block the ventilation holes on the bottom.
- Do not place the player in a location near heat sources, or in a place subject to direct sunlight, excessive dust or mechanical shock.
- Do not put any heavy object on top of the player. The player may be damaged.

On operation

- If the player is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the player. Should this occur, the player may not operate properly. In this case, remove the disc and leave the player turned on for about half an hour until the moisture evaporates.

On adjusting volume

- Do not turn up the volume while listening to a portion with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level portion is played.

On cleaning

- Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

If you have any questions or problems concerning your player, please consult your nearest Sony dealer.

IMPORTANT NOTICE

Caution: The enclosed DVD player is capable of holding a still video image or On screen display image on your television screen indefinitely. If you leave the still video image or On screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Projection televisions are very susceptible.

Notes on Discs

On handling discs

- Do not use irregularly shaped CDs such as heart- or star-shaped CD as they may cause the player to malfunction.
- To keep the disc clean, handle the disc by its edge. Do not touch the surface.
- Do not stick paper or tape on the disc.
  If there is glue (or a similar substance) on the disc, remove the glue completely before using the disc.

- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as there can be considerable rise in temperature inside the car.
- After playing, store the disc in its case.

On cleaning

- Before playing, clean the disc with a cleaning cloth. Wipe the disc from the center out.

- Do not use solvents such as benzine, thinner, commercially available cleaners or anti-static spray intended for vinyl LPs.

Getting Started

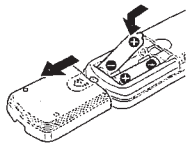
This section describes how to hook up the CD/DVD player to a TV (with audio/video input jacks) and/or an AV receiver (amplifier). You cannot connect this player to a TV which does not have a video input connector. Be sure to turn off the power of each component before making the connections.

Unpacking

Check that you have the following items:
- Audio/video connecting cord (1)
- S video cord (1)
- AC power adaptor AC-FI1 (1)
- AC power cord (1)
- Remote commander (remote) RMT-D109O (1)
- R6 (size AA) batteries (2)
- Stand (1)
- EURO AV adaptor (1, for the models available in Europe only)

Inserting batteries into the remote

You can control the player using the supplied remote. Insert two R6 (size AA) batteries by matching the + and – on the batteries. When using the remote, point it at the remote sensor ⊡ on the player.



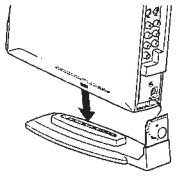
You can control TVs and AV receivers using the supplied remote
See page 54.

Notes
- Do not leave the remote in an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you will not use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

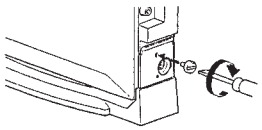
Using the player in a vertical position

If you want to use the player in a vertical position, attach the supplied stand.

1 Align the groove of the player and the projection of the stand.



2 Fasten the stand with the supplied screw.



Notes
- When you place the player in a horizontal position, remove the stand.
- To move the player, hold the player itself. If you hold the stand, the stand may break

TV Hookups

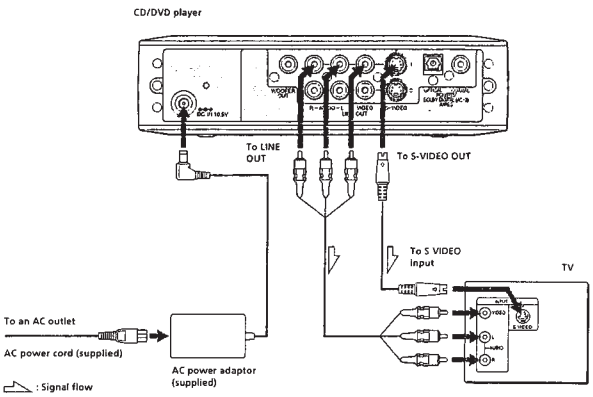
This connection is for listening to the sound through TV speakers (2ch – L, R). Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "NONE" in the setup display (page 53).

Required cords

Audio/video connecting cord (supplied) (1)

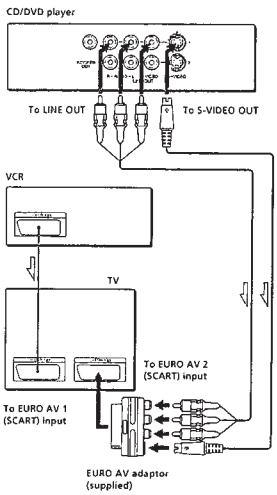
S video cord (supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Yellow (video) to Yellow, Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.
If your TV has an S video input connector, connect the component via the S-VIDEO connector using the S video cord. You will get a better picture.
Refer to the instructions supplied with the TV to be connected.

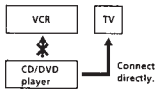


If your TV has a EURO AV (SCART) connector

Attach the supplied EURO AV adaptor to your TV, then connect the DVD player and the TV using the supplied audio/video connecting cord. If your TV has two EURO AV (SCART) connector, you may connect a VCR as shown below.
When you connect the S video cord, do not connect the yellow (video) plug of the audio/video connecting cord.



Notes
- Refer to the instructions supplied with the component to be connected.
- Do not connect this player to a video deck. If you view the pictures on your TV after making the connections shown below, a picture noise may appear.



- Depending on the TV or receiver (amplifier), sound distortion may occur because the audio output level is high. In this case, set "AUDIO ATT" in "AUDIO SETUP" to "ON" in the setup display. For details, see page 50.
- If you cannot view the pictures from a VCR through this player which is connected to a TV with RGB, set ⊣⊡1 to ⊡(Audio/Video) on your TV. When you select ⊣⊡(RGB), the TV cannot receive the signal from the VCR.

Setups for the player

Some setups are necessary for the player depending on the TV or other components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 42.

- To connect the player to a wide-screen TV
  In the setup display, set "TV TYPE" in "SCREEN SETUP" to "16:9" (default setting). For details, see page 46.
- To connect the player to a normal TV
  In the setup display, set "TV TYPE" in "SCREEN SETUP" to "4:3 LETTER BOX" or "4:3 PAN SCAN." For details, see page 46.

This player conforms to the PAL color system. When you play a disc recorded in the NTSC color system, the player outputs the video signal or the setup display etc. in the NTSC color system and the picture may not appear on the TV screen. In this case, eject the disc.

Receiver (Amplifier) Hookups

This connection is for listening to the sound through speakers connected to a receiver. Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "NONE" in the setup display (page 53).

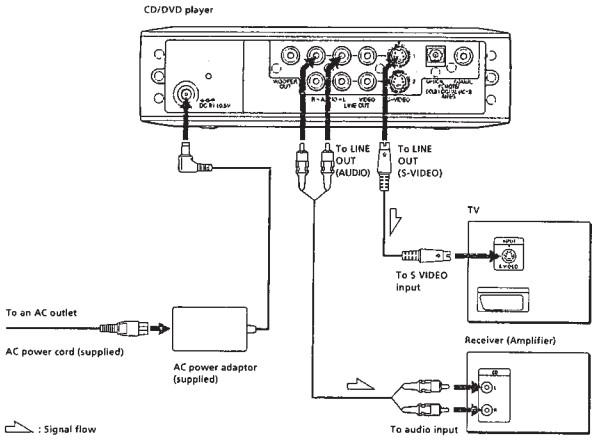
You can enjoy surround when connecting front speakers only
You can use 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (Virtual Enhanced Surround). For details, see page 35.

Required cords

Audio connecting cord (not supplied) (1)

S video cord (supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.

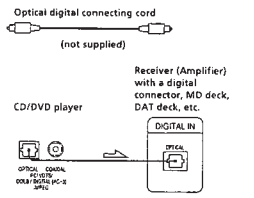


Note
You cannot enjoy the picture with S video signal if your TV is not conformed to the S video signal. When your TV does not have S VIDEO input, connect the component via the VIDEO INPUT connector using the video connecting cord (not supplied) instead of the S video cord. For details, see page 10.
Refer to the instructions supplied with your TV.

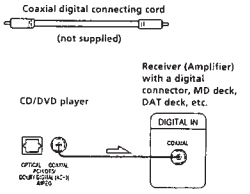
If you have a digital component such as a receiver (amplifier) with a digital connector, DAT or MD

Connect the component via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied).

■ When using an optical digital connecting cord



■ When using a coaxial digital connecting cord



Notes
- Refer to the instructions supplied with the component to be connected.
- You cannot make digital audio recordings of discs recorded in multi-channel surround format directly using an MD deck or DAT deck.

When you make the connections above, do not set "DOLBY DIGITAL" to "DOLBY DIGITAL," "MPEG" to "MPEG" and "DTS" to "ON." If you do, a loud noise will suddenly come out from the speakers, affecting your ears or causing the speakers to be damaged.

If you have a digital component with a built-in DTS, Dolby Digital or MPEG decoder
You can enjoy multichannel surround sound by connecting the component via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied). For details on hookups and settings, see page 15.

Setups for the player

Some setups are necessary for the player depending on the components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 42.

- **To listen to the sound through speakers connected to a receiver (amplifier) having a digital connector or to output the sound to a digital component such as a DAT or MD deck**
  When you play a DVD, set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DOLBY DIGITAL" to "D-PCM," "MPEG" to "PCM" and "DTS" to "OFF" in the setup display (page 51). These are the default settings.

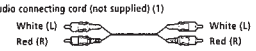
2.1 Channel Surround Hookups

This connection is for listening to the sound through the left and right speakers of the TV, or those connected to a receiver and the subwoofer. You can enjoy rich bass frequencies by connecting a subwoofer. Refer to the instructions supplied with the component to be connected.
Set "SUBWOOFER" in "SPEAKER SETUP" to "YES" in the setup display (page 53). Then set "FRONT SPEAKER SIZE" to "TV" when you use the TV's speakers, or to "LARGE," "MIDDLE" or "SMALL" when you use the speakers connected to the receiver.

You can enjoy surround when connecting front speakers only
You can use 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers (Virtual Enhanced Surround). For details, see page 35.

Required cords

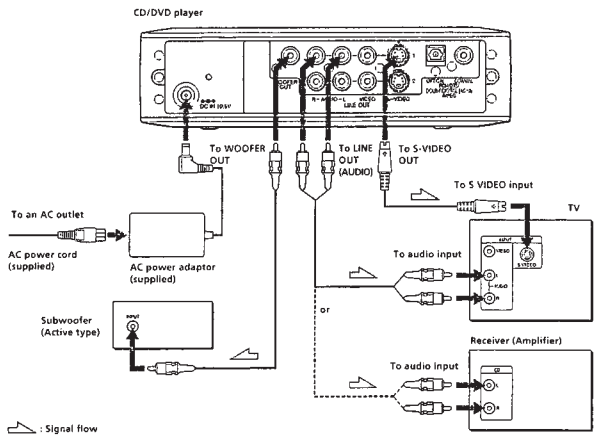
Audio connecting cord (not supplied) (1)



S video cord (supplied) (1)

When connecting the cords, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.

Monaural audio cord (not supplied) (1)
One for a subwoofer



Note
You cannot enjoy the picture with S video signal if your TV is not conformed to the S video signal. When your TV does not have S VIDEO input, connect the component via the VIDEO INPUT connector using the video connecting cord (not supplied) instead of the S video cord. For details, see page 10.
Refer to the instructions supplied with your TV.

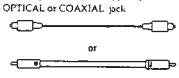
5.1 Channel Surround Hookups

With DVDs which contain DTS, Dolby* Digital or MPEG AUDIO sound, you can enjoy the surround sound while producing the effect of being in a movie theater or a concert hall, using a digital component with a built-in DTS, Dolby Digital or MPEG decoder (not supplied). The player outputs the surround sound signals from the OPTICAL and COAXIAL connectors.
Using a receiver (amplifier) having the OPTICAL or COAXIAL connector and the 5 (+1) speakers, you can enjoy more real audio presence in the comfort of your own home.

Required cords

Audio cords (not supplied)
One for the LINE OUT AUDIO jacks

Optical or coaxial digital cord (not supplied)
One for the OPTICAL or COAXIAL jack



S video cord (supplied)
One for the S-VIDEO jack

Connect the component via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord (not supplied). You do not need to connect both of these cords. See the figure on the next page.

Notes
- Do not connect the power cord to an AC outlet or press the POWER switch before completing all connections.
- Refer to the instructions supplied with the component to be connected.
- The cord connectors should be fully inserted into the jacks. Loose connection may cause hum and noise.
- Jacks and plugs of the connecting cords are color-coded as follows:
  Red jacks and plugs: Right audio channel
  White jacks and plugs: Left audio channel

Setups for the player

Some setups are necessary for the player depending on the components to be connected.
Use the setup display to change the various settings.
For details on using the setup display, see page 42.

- **When you play a DVD that is recorded in DTS format**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DTS" to "ON" in the setup display (page 51).
- **When you play a DVD that is recorded in Dolby Digital format**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "DOLBY DIGITAL" to "DOLBY DIGITAL" in the setup display (page 51).
- **When you play a DVD that is recorded in MPEG format**
  Set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "MPEG" to "MPEG" in the setup display (page 51).

Notes
- Refer to the instructions supplied with the component to be connected.
- **When you do not connect an audio component with a built-in DTS decoder, do not set "DTS" to "ON."**
- **When you do not connect an audio component with a built-in DOLBY DIGITAL decoder, do not set "DOLBY DIGITAL" to "DOLBY DIGITAL."**
- **When you do not connect an audio component with a built-in MPEG decoder, do not set "MPEG" to "MPEG."**

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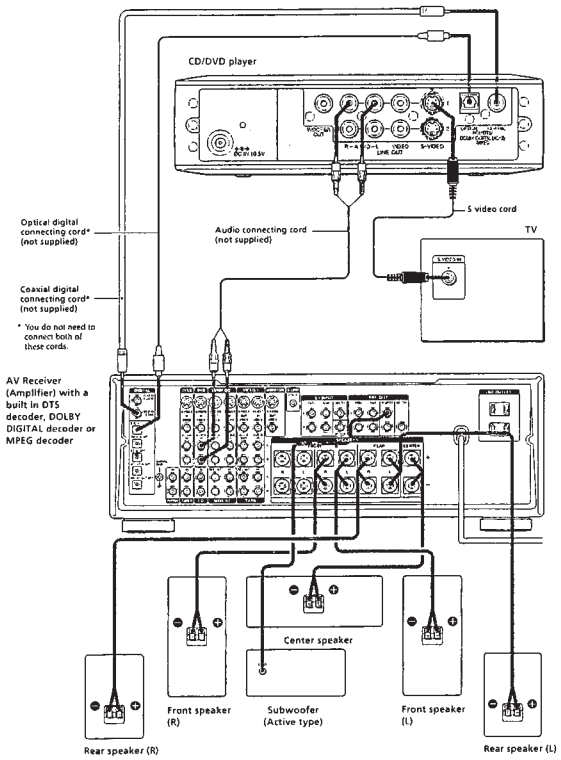
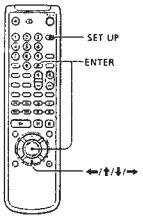
5.1 Channel Surround Hookups

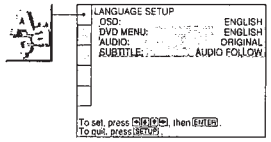

CD/DVD player
S video cord
TV
Optical digital connecting cord* (not supplied)
Audio connecting cord (not supplied)
Coaxial digital connecting cord* (not supplied)
* You do not need to connect both of these cords.
AV Receiver (Amplifier) with a built in DTS decoder, DOLBY DIGITAL decoder or MPEG decoder
Center speaker
Front speaker (R)
Subwoofer (Active type)
Front speaker (L)
Rear speaker (R)
Rear speaker (L)

Selecting the Language for On-Screen Display

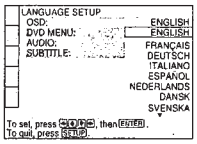
You can select the language for the setup display, the Control Menu display or the messages displayed on the screen. Default setting is "ENGLISH."



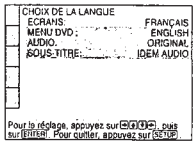
1 Press SET UP and select "LANGUAGE SETUP" using ↑/↓, and then press ENTER.



2 Select "OSD" using ↑/↓, then press → or ENTER.



3 Select "FRANÇAIS" using ↑/↓, then press ENTER.


CHOIX DE LA LANGUE
ECRANS: FRANÇAIS
MENU DVD: ENGLISH
AUDIO: ORIGINAL
SOUS-TITRE: IDEM AUDIO
Pour le réglage, appuyez sur ←/↑/↓/→, puis sur ENTER. Pour quitter, appuyez sur SETUP.

To cancel using the setup display on the way
Press SET UP.

Note
The languages you can select are the ones displayed in Step 2.
For details, see page 45.

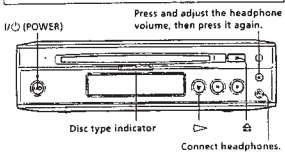
Playing Discs

This chapter describes how to play a DVD/CD/VIDEO CD.

This player conforms to the PAL color system. When you play a disc recorded in the NTSC color system, the player outputs the video signal of the setup display etc. in the NTSC color system and the picture may not appear on the TV screen. In this case, eject the disc.

Playing Discs DVD VIDEO CD CD

Depending on the DVD or VIDEO CD, some operations may be different or restricted. Refer to the instructions supplied with your disc.

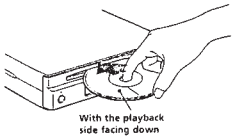


1 Make settings on your TV.
Turn on the TV and select the video input so that you can view the pictures from this player.

When using a receiver (amplifier)
Turn on the receiver (amplifier) and select the appropriate position so that you can listen to the sound from this player.

2 Press I/⏻ (POWER) to turn on the player.
The indicator (red) above the I/⏻ (POWER) button changes to green and the front panel display lights up.

3 Insert the disc.
The corresponding disc type indicator lights up.

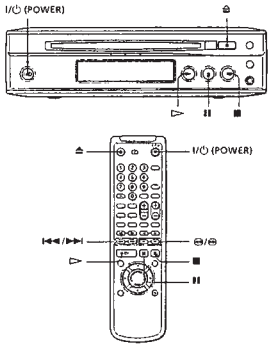


4 Press ⏵.
The player starts playback (Continuous Play). Adjust the volume on the TV or the receiver (amplifier).

After following Step 4
■ When playing a DVD
A DVD menu or title menu may appear on the TV screen (see page 22).
■ When playing a VIDEO CD
The menu screen may appear on the TV screen depending on the VIDEO CD. You can play the disc interactively, following the instructions on the menu screen. (PBC Playback, see page 23.)

You can turn on the player using the remote
Press I/⏻ (POWER) when the indicator above the I/⏻ (POWER) button on the front panel is lit in red.

Notes
- If you leave the player or the remote in pause or stop mode for 15 minutes, the screen saver image appears automatically. To make the screen saver image go away, press ⏵. (If you want to set the screen saver function to off, see page 46.)
- The indicator above the I/⏻ (POWER) button lights up in red when the power is turned off.
- If you don't operate the player or the remote for more than 30 minutes when a disc is not being played, the power is automatically turned off. (Auto Power Off function)
- When you insert an 8-cm disc, insert the disc slowly at the center of the disc slot. If you cannot eject the disc, consult your nearest Sony dealer.

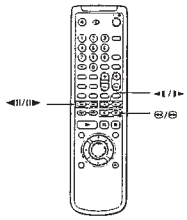


To	Operation
Stop	Press ■.
Pause	Press ⏸.
Resume play after pause	Press ⏸ or ⏵.
Go to the next chapter, track or scene in continuous play mode	Press ⏭ on the remote.
Go back to the preceding chapter, track or scene in continuous play mode	Press ⏮ on the remote
Locate a point while monitoring the picture (Scan)	Press ⊖ or ⊕ on the remote. When you find the point you want, press ⏵ to return to the normal speed.
Stop play and remove the disc	Press ⏏.

You can play discs in various modes such as Program Play using the on-screen menu (Control Menu). For operations of Control Menu, see page 26.

Searching for a Particular Point on a Disc

You can locate a particular point on a disc by monitoring the picture, playing back slowly or playing frame by frame.



Note
Depending on the DVD/VIDEO CD, you may not be able to do some of the operations described.

Locating a point quickly by playing a disc fast forward or fast reverse (Speed scan)

Press ⊖ or ⊕ while playing a disc. When you find the point, press ▷ to return to the normal speed.
Each time you press the ⊖ or ⊕ button during Speed scan, the playback speed changes. Two speeds are available. With each press, the indication changes as follows:

1►► ⟷ 2►► (playback direction)
1◄◄ ⟷ 2◄◄ (opposite direction)

The playback speed of 2►► /2◄◄ is faster than 1►► /1◄◄.

Locating a point slowly by observing the screen (Slow-motion play)

DVD VIDEO CD

You can use this function only for DVDs or VIDEO CDs.
Press ◄II or II► while playing a disc. When you find the point, press ▷ to return to the normal speed.
Each time you press the ◄II or II► button during Slow-motion play, the playback speed changes. Two speeds are available. With each press, the indication changes as follows:

1II► ⟷ 2II► (playback direction)
1◄II ⟷ 2◄II (opposite direction – DVD only)

The playback speed of 2II► /2◄II is slower than 1II► /1◄II.

Playing a disc frame by frame

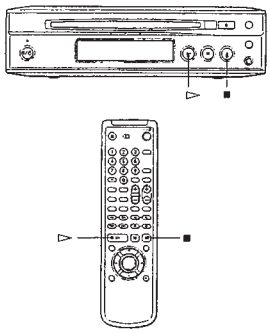
DVD VIDEO CD

You can use this function only for DVDs or VIDEO CDs.
Press ◄II or II► while playing a disc. To return to normal playback, press ▷.

Resuming Playback from the Point Where You Stopped the Disc (Resume Play)

DVD VIDEO CD CD

The player stores the point where you stopped the disc and if "RESUME" appears on the front panel display. You can resume playback from that point.
As long as you do not eject the disc, Resume Play is available even if you turn the power off.



1 While playing a disc, press ■ to stop playback.
"RESUME" appears in the front panel display and "When playing next time, disc restarts from point you stopped." appears on the TV screen.
If "RESUME" does not appear, Resume Play is not available.

2 Press ▷.
The player starts playback from the point where you stopped the disc in Step 1.

To play from the beginning of the disc
When the playing time appears on the front panel display before you start playing, press ■ to reset the playing time, then press ▷.

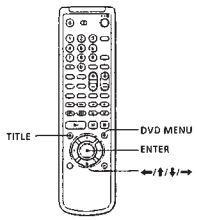
Notes
- Resume Play may not be available depending on the DVD.
- Resume Play is not available in Shuffle or Program Play mode.
- Depending on where you stopped the disc, the player may resume playback from a different point.
- The point where you stopped playing is cleared when:
  - you eject the disc
  - you disconnect the AC power cord
  - you change the play mode
  - you start playback after selecting a title, chapter or track
  - you change the settings of "TV TYPE" in "SCREEN SETUP" in the setup display
  - you change the settings of "PARENTAL CONTROL" in "CUSTOM SETUP" in the setup display

Using the Menu for Each DVD

DVD

Using the title menu

A DVD is divided into long sections of a picture or a music piece called "titles." When you play a DVD which contains several titles, you can select the title you want using the title menu.



1 Press TITLE.
The title menu appears on the TV screen. The contents of the menu vary from disc to disc.

2 Press ←/↑/↓/→ to select the title you want to play.
Depending on the disc, you can use the number buttons to select the title.

3 Press ENTER.
The player starts playing the selected title.

Notes
- Depending on the DVD, you may not be able to select the title.
- Depending on the DVD, a "title menu" may simply be called a "menu" or "title" in the instructions supplied with the disc. "Press ENTER." may also be expressed as "Press SELECT."

Using the DVD menu

Some DVDs allow you to select the disc contents using the menu. When you play these DVDs, you can select the language for the subtitles, the language for the sound, etc., using the DVD menu.

1 Press DVD MENU.
The DVD menu appears on the TV screen. The contents of the menu vary from disc to disc.

2 Press ←/↑/↓/→ to select the item you want to change.
Depending on the disc, you can use the number buttons to select the item.

3 To change other items, repeat Step 2.

4 Press ENTER.

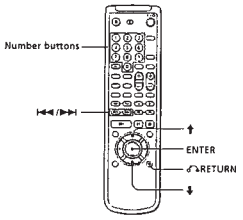
If you want to select the language for the DVD menu
Change the setting using "LANGUAGE SETUP" in the setup display. For details, see page 45.

Note
Depending on the DVD, a "DVD menu" may simply be called a "menu" in the instructions supplied with the disc.

Playing VIDEO CDs with PBC Functions (PBC Playback)

VIDEO CD

When playing VIDEO CDs with PBC functions (Ver. 2.0 discs), you can enjoy simple interactive operations, operations with search functions, etc.
PBC Playback allows you to play VIDEO CDs interactively, following the menu screen on the TV screen. On this player, you can use the number buttons, ENTER, ⏮, ⏭, ↑/↓ and ↶RETURN during PBC Playback.



1 Start playing a VIDEO CD with PBC functions, following Steps 1 to 4 in "Playing Discs" on page 18.

2 Press the number button of the item you want.

3 Press ENTER.

4 Follow the instructions on the menu screen for interactive operations.
Refer to the instructions supplied with the disc, as the operating procedure may differ according to the VIDEO CD.

Going back to the menu screen
Press ↶RETURN, ⏮ or ⏭.

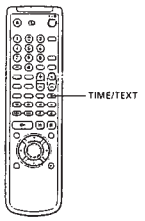
When playing VIDEO CDs with PBC functions
PBC playback starts automatically.

To cancel PBC playback of a VIDEO CD with PBC functions and play the disc in Continuous Play mode
There are two ways.
- Before you start playing, select the track you want using ⏮ or ⏭, then press ENTER or ▷.
- Before you start playing, select the track number using the number buttons on the remote, then press ENTER or ▷. "Play without PBC" appears on the TV screen and the player starts Continuous Play. You cannot play still pictures such as a menu screen.
To return to PBC playback, press ■ twice then press ▷.

Note
Depending on the VIDEO CD, "Press ENTER." in Step 3 may be expressed as "Press SELECT." in the instructions supplied with the disc.

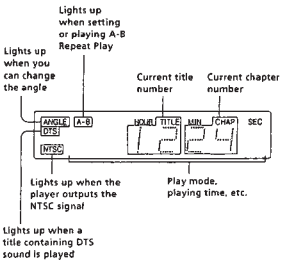
Using the Front Panel Display

You can check information about the disc, such as the total number of the titles or the tracks or remaining time, using the front panel display.



When playing back a DVD

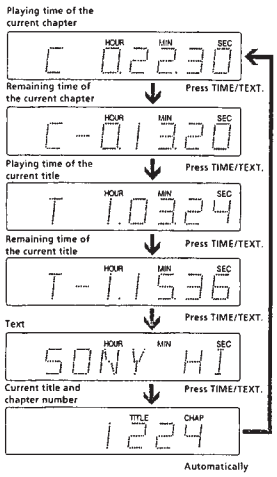
Display information while playing the disc



Checking the remaining time

Press TIME/TEXT.

Each time you press TIME/TEXT while playing the disc, the display changes as shown in the following chart.

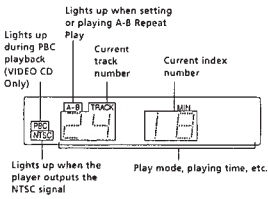


Notes

- Depending on the DVD, the chapter number or time may not appear or you may not be able to change the front panel display.
- While you are doing Shuffle Play or Program Play, the playing time of the title and the remaining time of the title are not displayed.

When playing back a CD/VIDEO CD

Display information while playing a disc



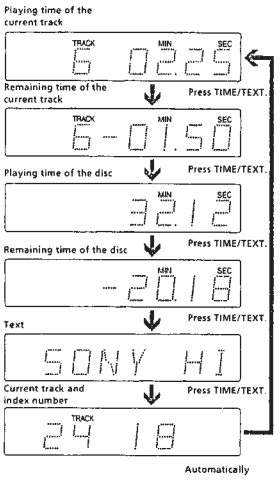
When playing VIDEO CDs with PBC functions

The current scene number is displayed instead of the current track number and the current index number. In this case, the front panel display does not change when you press TIME/TEXT. If the TEXT is recorded in the disc, the front panel display changes to Text display when you press TIME/TEXT (see page 31).

Checking the remaining time

Press TIME/TEXT

Each time you press TIME/TEXT while playing a disc, the display changes as shown in the following chart.



Note

While you are doing Shuffle Play, Program Play, or PBC playback, the playing time of the disc and the remaining time of the disc are not displayed.

Using Various Functions with the Control Menu

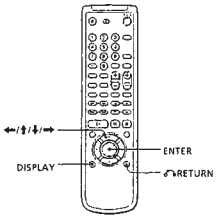
This chapter describes how to play discs in various modes and how to use the convenient features of the on-screen menu (Control Menu).

Using the Control Menu Display

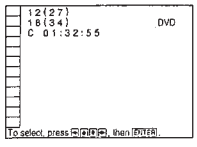
Using the Control Menu display, you can select the start point, play in a order you like, change the angles, set for Digital Cinema Sound, etc.

The items are different depending on the kind of disc.

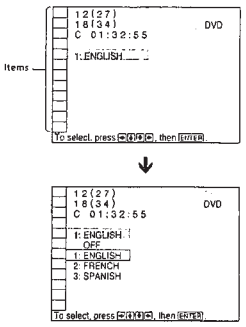
For details on each Control Menu display item, see pages 29 to 41.



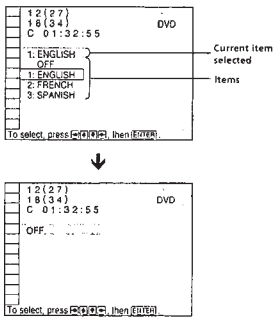
1 Press DISPLAY to show the Control Menu display on the TV screen.



2 Select the item you want using ↑/↓, then press → or ENTER.



3 Select the item you want using ↑/↓, then press ENTER.



Note

Some Control Menu display items require operations other than selecting the setting. For details on these items, see the relevant pages.

To cancel using the Control Menu display on the way

Press RETURN.

To display other items

Each time you press DISPLAY, the Control Menu display changes as follows:

Control Menu display
↓
ADVANCED display (See page 41.)
↓
Control Menu display off

You can display some items using the remote

Some items can be displayed by pressing the button of the remote. In this case, only the item you selected is displayed. For the item and operations using the remote, see the pages of each item.

Control Menu Item List

TITLE **(DVD only) (page 29)**

CHAPTER **(DVD only) (page 29)**

TRACK **(VIDEO CD/CD only) (page 29)**

INDEX **(VIDEO CD/CD only) (page 29)**

SCENE **(VIDEO CD during PBC playback only) (page 29)**

You can search by selecting the title/chapter/track/index.

TIME/TEXT **(page 30, 31)**

You can check the playing time and remaining time of the current title/chapter/track and the total remaining time of the disc.
You can search by inputting the time code.
You can check the DVD TEXT or CD TEXT of the disc on the TV screen and the front panel display.

AUDIO **(page 32)**

With DVDs recorded with multilingual sounds, you can select the language you want while playing the DVD.
With multiplex CDs or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers.

SUBTITLE **(DVD only) (page 33)**

With DVDs on which multilingual subtitles are recorded, you can change the subtitle language whenever you want while playing the DVD, and turn it on or off whenever you want.

ANGLE **(DVD only) (page 34)**

With DVDs on which various angles (multi-angles) are recorded, you can change the angles on the scene for which multi-angles are recorded.

VES **(page 35)**

Select the mode to enjoy multichannel surround sound such as Dolby Digital and MPEG.
Even if you connect only front speakers, Virtual Enhanced Surround (VES) lets you enjoy 3D sound by using 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers.
You can feel the more effective 3D sound when you connect a receiver (amplifier) with digital (optical or coaxial) input, 2 front speakers, 2 rear speakers, 1 center speaker and 1 subwoofer.

PROGRAM **(page 36)**

You can play the contents of the disc in the order you want by arranging the order of the titles, chapters or tracks on the disc to create your own program.

SHUFFLE **(page 38)**

You can have the player "shuffle" titles, chapters or tracks and play them in a random order. The playing order may differ from the previous "shuffling."

REPEAT **(page 39)**

You can play all the titles/tracks on a disc or a single title/chapter/track repeatedly.

A-B REPEAT **(page 39)**

You can play a specific portion of a title, chapter, or track repeatedly.

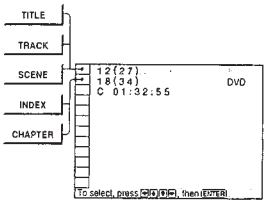
ADVANCED **(DVD only) (page 41)**

You can check the play information about the bit rate, bit rate history or the position where the disc is played (layer).

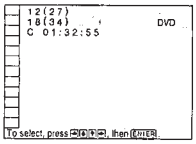
Searching for the Title/Chapter/Track/Index/Scene

DVD VIDEO CD CD

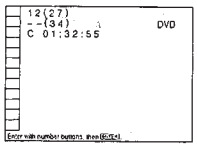
You can search by selecting the title/chapter/track/index/scene.
Select "TITLE," "CHAPTER," "TRACK", "INDEX" or "SCENE" after pressing DISPLAY.
When you play back a DVD, "TITLE" and "CHAPTER" are displayed.
When you play back a VIDEO CD/CD, "TRACK" and "INDEX" are displayed. When you play back a VIDEO CD with PBC functions, "SCENE" is displayed.



1 Select "TITLE," "CHAPTER," "TRACK" or "INDEX" using ↑/↓.
"✻✻(✻✻)" is highlighted. (✻✻ means optional number in this manual.) Number in parentheses indicate the total number of titles, chapters, tracks or indexes.



2 Press → or ENTER.
"✻✻(✻✻)" is changed to "——(✻✻)."



3 Select the number of the title, chapter, track or index you want to search for using the number buttons, then press ENTER.
The player starts searching. To cancel the number, press CLEAR before pressing ENTER.

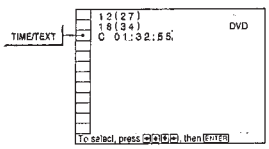
To cancel selecting
Press ↶RETURN.

Notes
- The number of titles, chapters or tracks displayed is that of the titles, chapters or tracks recorded on a disc.
- The index numbers are not displayed during PBC playback of VIDEO CDs.

Checking the Playing Time and Remaining Time

DVD VIDEO CD CD

You can check the playing time and remaining time of the current title/chapter/track and the total remaining time of the disc.
Press DISPLAY. Then press TIME/TEXT on the remote to change the time information.
You can also check the DVD TEXT and CD TEXT. See page 31.



When playing a DVD
■TIME/TEXT
- C ✻✻:✻✻:✻✻ : Playing time of the current chapter
- C -✻✻:✻✻:✻✻ : Remaining time of the current chapter
- T ✻✻:✻✻:✻✻ : Playing time of the current title
- T -✻✻:✻✻:✻✻ : Remaining time of the current title

When playing a VIDEO CD (during PBC playback)
■TIME/TEXT
- ✻✻:✻✻ : Playing time of the current scene

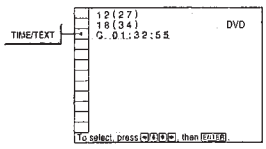
When playing a VIDEO CD (in Continuous play) or CD
■TIME/TEXT
- T ✻✻:✻✻ : Playing time of the current track
- T -✻✻:✻✻ : Remaining time of the current track
- D ✻✻:✻✻ : Playing time of the current disc
- D -✻✻:✻✻ : Remaining time of the current disc

You can display "TIME/TEXT" display quickly
Press TIME/TEXT on the remote. Each time you press the button, the time information changes.

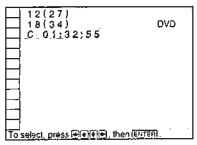
Selecting a Start Point Using the Time Code

DVD

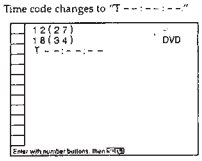
You can search by inputting the time code.
Select "TIME/TEXT" after pressing DISPLAY.
The time code corresponds to the approximate actual playing time. For example, to search for a scene 2 hours 30 minutes 20 seconds past the beginning, input 2:30:20.



1 Select "C ✻✻:✻✻:✻✻" (playing time of the current chapter).



2 Press → or ENTER.
Time code changes to "T --:--:--."



3 Input the time code using the number buttons, then press ENTER.
The player starts searching. To cancel the number, press CLEAR before pressing ENTER.

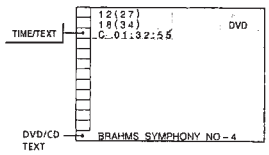
To cancel inputting
Press ↶RETURN.

Note
When you input the time code, input the playing time of the title.

Checking the Information of the Disc

DVD VIDEO CD CD

You can check the DVD TEXT or CD TEXT of the disc on the TV screen and the front panel display.
DVD TEXT and CD TEXT are information recorded on the disc which you cannot change.
Press DISPLAY. Then press TIME/TEXT on the remote until DVD/CD TEXT is displayed.
The information is displayed at the bottom of the display.

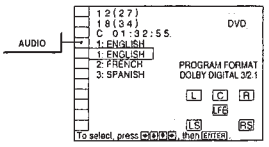


You can display "TIME/TEXT" display quickly
Press TIME/TEXT on the remote. To display DVD/CD TEXT, press TIME/TEXT until DVD/CD TEXT is displayed.

Note
The DVD TEXT only in English is displayed.

Changing the Sounds

With DVDs recorded with multilingual sounds, you can select the language you want while playing the DVD.
With multiplex CDs or VIDEO CDs, you can select the sound from the right or left channel and listen to the sound of the selected channel through both the right and left speakers. In this case, the sound loses the stereo effect. For example, with a disc containing a song, the right channel may output the vocals and the left channel may output the instrumental. If you only want to hear the instrumental, you can select the left channel and hear it from both speakers.
Select "AUDIO" after pressing DISPLAY.



■AUDIO

When playing a DVD

Select the language. The languages you can select are different depending on the DVD. When 4 digits are displayed, they represent the language code. Select the language code from the list on page 63.

When playing a VIDEO CD or a CD

- STEREO : The standard stereo sound
- 1/L : The sound of the left channel (monaural)
- 2/R : The sound of the right channel (monaural)

You can display "AUDIO" display quickly

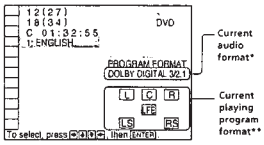
Press AUDIO on the remote.

Notes

- Depending on the DVD, you may not be able to change the languages even if multilingual sounds are recorded on the DVD.
- While playing the CD/VIDEO CD, the standard stereo playback will be resumed when:
  - you eject the disc
  - you turn the power off
- While playing the DVD, the sound may be changed when:
  - you eject the disc
  - you change the title
- If the language is displayed as a 4 digit number, refer to the language code list on page 63.

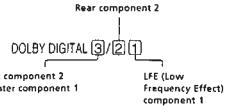
Displaying the audio information of the disc DVD

When you select "AUDIO," the playing channels are displayed on the screen.
In Dolby Digital format, the signals from monaural to 5.1 channels can be recorded on a DVD. Depending on the DVD the number of the recorded channels may be different.



* "PCM," "DTS," "DOLBY DIGITAL" or "MPEG" is displayed. In "DOLBY DIGITAL" case, the channels in the playing track are displayed by number as follows:

The case of Dolby Digital 5.1 ch:

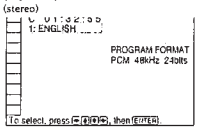


** The letters in the program format display mean the following:

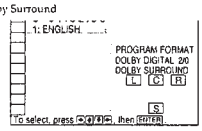
L: Front (L)
R: Front (R)
C: Center (monaural)
LS: Rear (L)
RS: Rear (R)
S: Rear (monaural) – the rear component of the Dolby Surround processed stereo signal and the Dolby Digital signal.
LFE: – LFE (Low Frequency Effect)

The display examples are as follows:

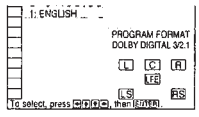
•PCM (stereo)



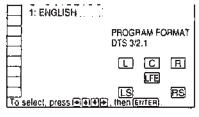
•Dolby Surround



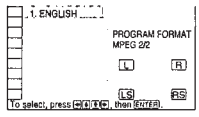
•Dolby Digital 5.1ch



•DTS



•MPEG

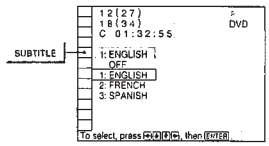


You can find Dolby Surround-encoded software by looking at the packaging

Use discs with the DOLBY DIGITAL logo. In order to enjoy Dolby Digital playback you must use discs bearing this logo.

Displaying the Subtitles

With DVDs on which subtitles are recorded, you can turn the subtitles on and off whenever you want while playing the DVD.
With DVDs on which multilingual subtitles are recorded, you can change the subtitle language whenever you want while playing the DVD, and turn it on or off whenever you want. For example, you can select the language you want to master and turn the subtitles on for better understanding.
Select "SUBTITLE" after pressing DISPLAY.



■SUBTITLE

Select the language. The languages you can select are different depending on the DVD. When 4 digits are displayed, they indicate the language code. Select the language code from the list on page 63.

You can display the "SUBTITLE" display quickly

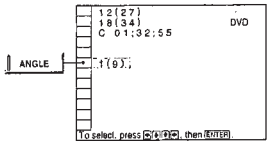
Press SUBTITLE on the remote. Each time you press the button, the item changes.

Notes

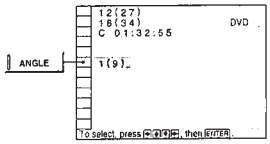
- When playing a DVD on which no subtitles are recorded, no subtitles appear.
- Depending on the DVD, you may not be able to turn the subtitles on even if they are recorded on it.
- Depending on the DVD, you may not be able to turn the subtitles off.
- If the language is displayed as a 4-digit number, refer to the language code list on page 63.
- The type and number of languages for subtitles vary from disc to disc.
- Depending on the DVD, you may not be able to change the subtitles even if multilingual subtitles are recorded on it.
- While playing the DVD, the subtitle may change when:
  - you eject the disc
  - you change the title

Changing the Angles

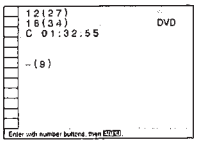
With DVDs on which various angles (multi-angles) for a scene are recorded, you can change the angles. For example, while playing a scene of a train in motion, you can display the view from either the front of the train, the left window of the train or from the right window without having the train's movement interrupted.
Select "ANGLE" after pressing DISPLAY. When the angles can be changed, the indicator of the "ANGLE" lights in green.



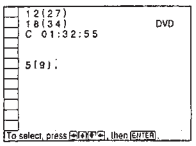
1 Select "ANGLE."



2 Press →.
The number of the angle changes to "–." The number in parentheses indicates the total number of angles.



3 Select the number of the angles using the number buttons or ↑/↓, then press ENTER.
The angle is changed to the selected angle.



Notes

- The number of angles varies from disc to disc or from scene to scene. The number of angles that can be changed on a scene is that of angles recorded for that scene.
- Depending on the DVD, you may not be able to change the angles even if multi-angles are recorded on the DVD.

You can specify the angle beforehand

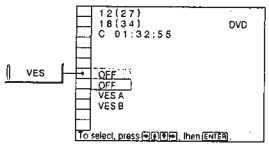
Specify the angle when "ANGLE" is not displayed on the front panel display. When a scene on which multi-angles are recorded comes, the angle is automatically selected.

You can select the angle directly

Press ANGLE on the remote. Each time you press the button, the angle changes.

Setting for Digital Cinema Sound

Select the mode to enjoy multichannel surround sound such as Dolby Digital and MPEG.
Even if you connect only front speakers, Virtual Enhanced Surround lets you enjoy 3D sound by using 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers.
You can feel the more effective 3D sound when you connect a receiver (amplifier) with digital (optical or coaxial) input, 2 front speakers, 2 rear speakers, 1 center speaker and 1 subwoofer.
Select "VES" after pressing DISPLAY. When you select the item except "OFF," the indicator of the "VES" lights in green.



■VES

Select the desired item. For details on each item, see "Effects of each item."

- OFF
- VES A*
- VES B*

* These settings also effect the output from the LINE OUT (AUDIO) connectors.

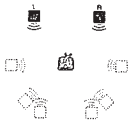
Effects of each item

OFF

Outputs 2-channel signals for stereo sound of the CD. 5-channel signals for Dolby Digital sound of the DVD are mixed down to 2-channel to be output.

VES (Virtual Enhanced Surround) A

Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below.



VES (Virtual Enhanced Surround) B

Uses 3D sound imaging to create virtual rear speakers from the sound of the front speakers (L, R) without using actual rear speakers. The virtual speakers are reproduced as shown in the illustration below.

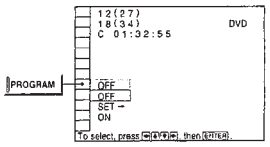
Notes

- The surround effect will be heard only when you set "DOLBY DIGITAL" to "D-PCM," and "MPEG" to "PCM" in "AUDIO SETUP."
- Some discs do not have rear sound. In this case, you cannot get the 3D surround effect.
- When you select an item, the sound cuts off for a moment.
- When the playing signal does not contain the surround component, the effects may be difficult to hear even if you select "VES A" or "VES B."
- Set the front speakers to form an equilateral triangle including the listening position, or the effects may be difficult to hear even if you select "VES A" or "VES B."
- When you connect a subwoofer, you can also hear the sound from the subwoofer.
- When you select "VES A" or "VES B," set the surround settings of the connected units such as the amplifier to OFF.

Creating Your Own Program (Program Play)

DVD VIDEO CD CD

You can play the contents of the disc in the order you want by arranging the order of the titles, chapters or tracks on the disc and create your own program. One program can be restored in the player and contain up to 99 titles, chapters and tracks.
Select "PROGRAM" after pressing DISPLAY. When you select "ON," the indicator of the "PROGRAM" lights in green.

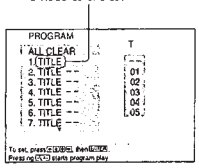


■PROGRAM
- OFF: plays normal.
- SET→: allows you to create your own program.
- ON: plays Program Play.

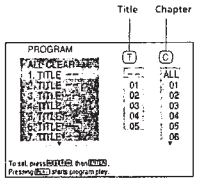
Creating the program

1 Select "SET→" in "PROGRAM."
The programming display appears.

"TRACK" is displayed when you play a VIDEO CD or a CD.

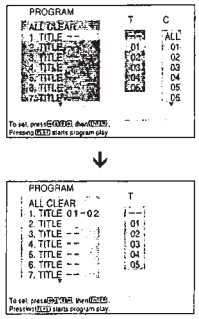


2 Press →.
"01" is highlighted. It is ready to set the first title or track for program.

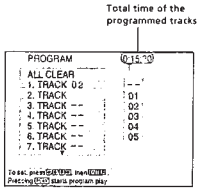


3 Select the title, chapter or track you want to program using ↑/↓, then press ENTER.
For example, select title or track 2.
(You can also use the number buttons and ENTER button to select. In this case, the selected number is displayed on the screen.)

■When playing a DVD
When both titles and chapters are recorded on the disc, select the title, then the chapter.



■When playing a VIDEO CD or CD
Select the track you want to program.



4 To program other titles, chapters or tracks, repeat Step 3.
The programmed titles, chapters or tracks are displayed from 2 in order.

5 Press ▷ to start Program Play.

To cancel Program Play
Press CLEAR.

To cancel programming
Press PROGRAM.

To change programming
1 In Step 2, select the program number of the title, chapter or track you want to change using ↑/↓.
2 Follow Step 3 for new programming.

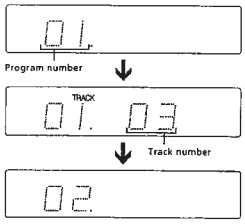
To cancel the programmed order
To cancel all the titles, chapters or tracks in the programmed order, select "ALL CLEAR" in Step 2.
To cancel the selected program, select the program using ↑/↓ in Step 2 then press CLEAR, or select "– –" in Step 3 then press ENTER.

The program remains even after the Program Play ends
When you press ▷, you can play the same program again.

You can do Repeat Play or Shuffle Play of the programmed titles, chapters or tracks
During Program Play, press REPEAT or SHUFFLE. Or set "REPEAT" or "SHUFFLE" to "ON" in the Control Menu display.

You can display "PROGRAM" display quickly
Press PROGRAM on the remote.

You can select discs, titles, chapters and tracks for the program by looking at the front panel display
You can program by looking at the front panel display instead of using the programming display on the TV screen.
When you select Track 3 in a VIDEO CD for Program 1, the front panel display will appear as follows:

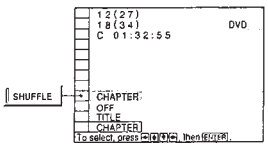


Notes
- The program is canceled when:
  - you eject the disc
  - you turn the power off
- You may not be able to do Program Play depending on the DVD.
- While you are doing PBC playback, you cannot set a program unless you stop playback once.

Playing in Random Order (Shuffle Play)

DVD VIDEO CD CD

You can have the player "shuffle" titles or tracks and play them in a random order. The playing order may differ from the previous "shuffling."
Select "SHUFFLE" after pressing DISPLAY. When you do not select "OFF," the indicator of the "SHUFFLE" lights in green.



■SHUFFLE
Selects the setting of Shuffle Play.

When playing a DVD and when Program Play is set to OFF
- OFF: does not play a disc in random order.
- TITLE: has the player "shuffle" titles and play in a random order.
- CHAPTER: has the player "shuffle" chapters and play in a random order.

When playing a VIDEO CD, CD or DVD (when Program Play is set to ON)
- OFF: does not play a disc in random order.
- ON: has the player "shuffle" titles or tracks and play in a random order.

When playing a VIDEO CD or CD (when Program Play is set to OFF)
- OFF: does not play a disc in random order.
- TRACK: has the player "shuffle" tracks and play in a random order.

To cancel Shuffle Play
Press CLEAR.

You can set Shuffle Play during stop
After selecting the item of "SHUFFLE," press ▷.
The player starts Shuffle Play.

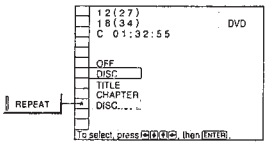
You can display the "SHUFFLE" display quickly
Press SHUFFLE on the remote.

Notes
- Shuffle Play is canceled when:
  - you eject the disc
  - you turn the power off
- You may not be able to do Shuffle Play depending on the DVD.
- Up to 200 chapters in a disc can be played in a random order when "CHAPTER" is selected.

Playing Repeatedly (Repeat Play)

DVD VIDEO CD CD

You can play all the titles/tracks on a disc or a single title/chapter/track.
In Shuffle or Program Play mode, the player repeats the titles or tracks in the shuffled or programmed order.
You cannot do Repeat Play during PBC playback of VIDEO CDs (page 23).
You may not be able to do Repeat Play depending on the DVD.
Select "REPEAT" after pressing DISPLAY. When you do not select "OFF," the indicator of the "REPEAT" lights in green.



■REPEAT
Selects the setting of Repeat Play.

When playing a DVD and when Program Play and Shuffle Play are set to OFF
- OFF: does not play repeatedly.
- DISC: repeats all the titles.
- TITLE: repeats the current title on a disc.
- CHAPTER: repeats the current chapter.

When playing a VIDEO CD/CD and when Program Play and Shuffle Play are set to OFF
- OFF: does not play repeatedly.
- DISC: repeats all the tracks on a disc.
- TRACK: repeats the current track.

When Program Play or Shuffle Play is set to ON
- OFF: does not play repeatedly.
- ON: repeats Program Play or Shuffle Play.

To cancel Repeat Play
Press CLEAR.

You can set Repeat Play during stop
After selecting the item of "REPEAT," press ▷.
The player starts Repeat Play.

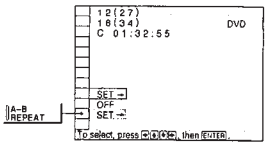
You can display the "REPEAT" display quickly
Press REPEAT on the remote.

Note
Repeat play is canceled when you turn the power off.

Repeating a Specific Portion (A↔B Repeat)

DVD VIDEO CD CD

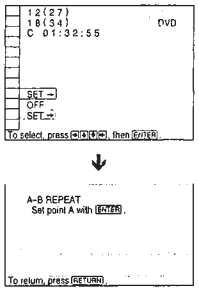
You can play a specific portion of a title, chapter, track repeatedly. This is useful when you want to memorize lyrics.
During PBC Playback of VIDEO CDs (page 23), this function is available only while playing moving pictures.
You may not be able to do A↔B Repeat Play depending on the DVD.
Select "A-B REPEAT" after pressing DISPLAY. During A↔B Repeat Play, the indicator of the "A-B REPEAT" lights in green.



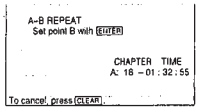
■A-B REPEAT
- SET→: sets the A and B points.
- OFF: does not play a specific portion of a title/chapter/track repeatedly.

Setting a portion for A↔B repeat

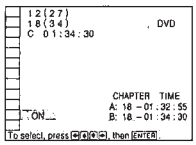
1 Select "SET➡" in "A-B REPEAT."
The A↔B REPEAT setting display appears.



2 During playback, when you find the starting point (point A) of the portion to be played repeatedly, press ENTER.
The starting point (point A) is set.



3 When you reach the ending point (point B), press ENTER again.
The setting points are displayed and the player starts repeating this specific portion.
"A-B" appears on the front panel display during A↔B repeat play.



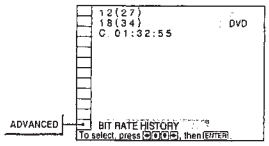
To cancel A↔B Repeat Play
Press CLEAR.

You can display the A↔B Repeat setting display quickly
Press A↔B on the remote.

Notes
- You can set A↔B Repeat on only one specific portion.
- A↔B Repeat is canceled when:
  - you eject the disc
  - you turn the power off
- When you set A↔B Repeat, the settings for Shuffle Play and Program Play are canceled.
- You may not be able to set A↔B Repeat, depending on the scene of the DVD or the VIDEO CD.

Checking the Play Information DVD

You can check the play information on the bit rate, bit rate history or the portion where the disc is played (layer). While playing a disc, the approximate bit rate of the playback picture is always displayed by Mbps (Mega bit per second) and the audio by kbps (Kilo bit per second). Select "ADVANCED" after pressing DISPLAY.

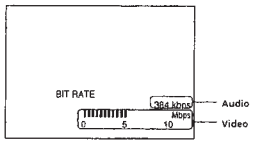


■ADVANCED

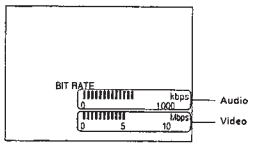
When playing a DVD
- BIT RATE: displays bit rate.
- BIT RATE HISTORY: displays bit rate and bit rate history.
- LAYER: displays layer and the point picked up.
- OFF: turns off ADVANCED display.

Displays of each item

BIT RATE

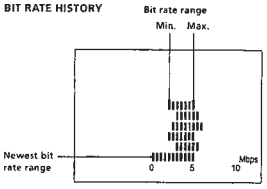


When you play MPEG AUDIO sound tracks



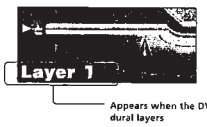
Bit rate refers to the amount of video/audio data per second in a disc. The higher the bit rate is, the larger the amount of data. When the bit rate level is high, there is a large amount of data. However, this does not always mean that you can get higher quality pictures or sounds.

BIT RATE HISTORY



Indicates the transition of bit rate of the playback picture for a period up to the present.

LAYER



Indicates the approximate point where the disc is playing. If it is a dual-layer DVD, the player indicates which layer is being read.
For details on the layers, see page 61 (DVD).

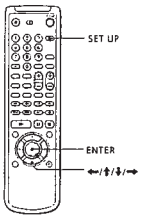
Settings and Adjustments

This chapter describes how to set and how to adjust using the on-screen SET UP menu. Most settings and adjustments are required to be set when you first use the player.
This chapter also describes how to set the remote for controlling the TV or the AV receiver (amplifier).

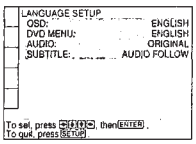
Using the Setup Display
DVD VIDEO CD CD

Using the setup display, you can do the initial setup, adjusting the picture and sound quality, setting the various outputs, etc. You can also set a language for the subtitles and the setup display, limit playback by children, etc.
For details on each setup display item, see pages 45 to 53.

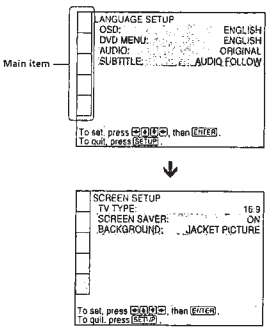
Note
You can display the setup display only when the player is in stop mode.



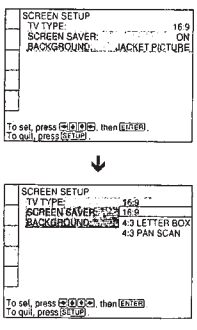
1 Press SET UP to display the setup display on the TV screen.



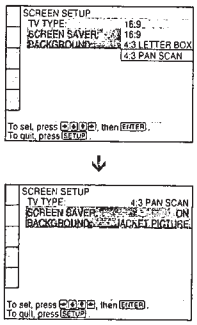
2 Select the main item you want using ↑/↓, and then press ENTER.
The selected main item is highlighted.



3 Select the item you want using ↑/↓, then press ➡ or ENTER.



4 Select the setting you want using ←/↑/↓/→, then press ENTER.

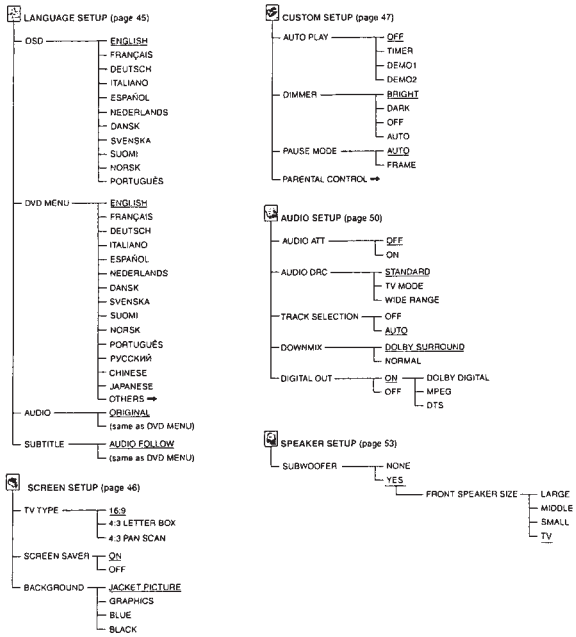


To cancel using the setup display on the way
Press SET UP on the remote.

Note
Some setup display items require operations other than selecting the setting. For details on these items, see the relevant pages.

Setup Display Item List

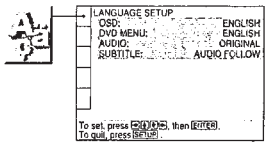
Default settings are underlined.


LANGUAGE SETUP (page 45)
OSD — ENGLISH, FRANÇAIS, DEUTSCH, ITALIANO, ESPAÑOL, NEDERLANDS, DANSK, SVENSKA, SUOMI, NORSK, PORTUGUÊS
DVD MENU — ENGLISH, FRANÇAIS, DEUTSCH, ITALIANO, ESPAÑOL, NEDERLANDS, DANSK, SVENSKA, SUOMI, NORSK, PORTUGUÊS, РУССКИЙ, CHINESE, JAPANESE, OTHERS ➡
AUDIO — ORIGINAL (same as DVD MENU)
SUBTITLE — AUDIO FOLLOW (same as DVD MENU)
SCREEN SETUP (page 46)
TV TYPE — 16:9, 4:3 LETTER BOX, 4:3 PAN SCAN
SCREEN SAVER — ON, OFF
BACKGROUND — JACKET PICTURE, GRAPHICS, BLUE, BLACK
CUSTOM SETUP (page 47)
AUTO PLAY — OFF, TIMER, DEMO1, DEMO2
DIMMER — BRIGHT, DARK, OFF, AUTO
PAUSE MODE — AUTO, FRAME
PARENTAL CONTROL ➡
AUDIO SETUP (page 50)
AUDIO ATT — OFF, ON
AUDIO DRC — STANDARD, TV MODE, WIDE RANGE
TRACK SELECTION — OFF, AUTO
DOWNMIX — DOLBY SURROUND, NORMAL
DIGITAL OUT — ON — DOLBY DIGITAL, MPEG, DTS; OFF
SPEAKER SETUP (page 53)
SUBWOOFER — NONE, YES
FRONT SPEAKER SIZE — LARGE, MIDDLE, SMALL
TV

Setting the Language for Display and Sound (LANGUAGE SETUP)

Select "LANGUAGE SETUP" after pressing SET UP.
"LANGUAGE SETUP" allows you to set various languages for on-screen display or sound.
Default settings are underlined.

Note
When you select a language that is not recorded on the DVD, one of the recorded languages is automatically selected except for the "OSD."



■OSD (On-Screen Display)
Switches the language for the on-screen display.
- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)

■DVD MENU
Switches the language for the DVD menu.
- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)
- РУССКИЙ (RUSSIAN)
- CHINESE (CHINESE)
- JAPANESE (JAPANESE)
- OTHERS➡

When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 63). After you have once selected, the language code (4 digits) is displayed.

■AUDIO
Switches the language for the sounds.
- ORIGINAL: the language given priority in the disc
- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)
- РУССКИЙ (RUSSIAN)
- CHINESE (CHINESE)
- JAPANESE (JAPANESE)
- OTHERS➡

When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 63). After you have once selected, the language code (4 digits) is displayed.

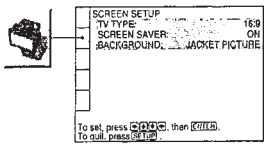
■SUBTITLE
Switches the language for the subtitles.
- AUDIO FOLLOW*
- ENGLISH (ENGLISH)
- FRANÇAIS (FRENCH)
- DEUTSCH (GERMAN)
- ITALIANO (ITALIAN)
- ESPAÑOL (SPANISH)
- NEDERLANDS (DUTCH)
- DANSK (DANISH)
- SVENSKA (SWEDISH)
- SUOMI (FINNISH)
- NORSK (NORWEGIAN)
- PORTUGUÊS (PORTUGUESE)
- РУССКИЙ (RUSSIAN)
- CHINESE (CHINESE)
- JAPANESE (JAPANESE)
- OTHERS➡

When you select "OTHERS➡," select and enter the language code from the list using the number buttons (page 63). After you have once selected, the language code (4 digits) is displayed.

* When you select "AUDIO FOLLOW," the language for the subtitles changes according to the language for the setting you selected in "AUDIO."

Settings for Display (SCREEN SETUP)

Select "SCREEN SETUP" after pressing SET UP.
"SCREEN SETUP" allows you to set the display according to the playback conditions.
Default settings are underlined.



■TV TYPE
Selects the aspect ratio of the TV to be connected.
- 16:9: when you connect a wide-screen TV to the player.
- 4:3 LETTER BOX: when you connect a normal TV to the player. Displays a wide picture with bands displayed on the upper and lower portions of the screen.
- 4:3 PAN SCAN: when you connect a normal TV to the player. Displays the wide picture on the whole screen with a portion automatically cut off.

16:9

4:3 LETTER BOX

4:3 PAN SCAN

Note
Depending on the DVD, "4:3 LETTER BOX" may be selected automatically instead of "4:3 PAN SCAN" and vice versa.

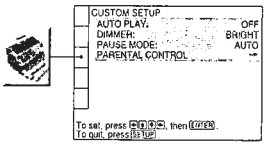
■SCREEN SAVER
Turns on and off the screen saver. If you turn on the screen saver, the screen saver image appears when you leave the player or the remote in pause or stop mode for 15 minutes or when you play back a CD for more than 15 minutes. The screen saver is useful to prevent your display from becoming damaged.
- ON: turns on the screen saver.
- OFF: turns off the screen saver.

■BACKGROUND
Selects the background color or picture of the TV screen in stop mode or while playing a CD.
- JACKET PICTURE: The jacket picture appears in the background, but only when the jacket picture is already recorded on the disc.
- GRAPHICS: The graphic picture stored in memory in the player beforehand appears in the background.
- BLUE: The background color is blue.
- BLACK: The background color is black.

Note
If a disc which does not contain the jacket picture is played while "BACKGROUND" is set to "JACKET PICTURE," the graphic picture stored in the player will automatically appear in the background.

Custom Settings (CUSTOM SETUP)

Select "CUSTOM SETUP" after pressing SET UP.
"CUSTOM SETUP" allows you to set the playback conditions.
Default settings are underlined.



■AUTO PLAY
Selects the setting of Auto Play when you connect the AC power cord to the AC outlet.
- OFF: does not use "TIMER," "DEMO1" or "DEMO2" to start playing.
- TIMER: starts playing a disc automatically when you connect the AC power cord to the AC outlet. By connecting a timer (not supplied), you can start playing at any time you want.
- DEMO1: starts playing the demonstration 1 automatically.
- DEMO2: starts playing the demonstration 2 automatically.

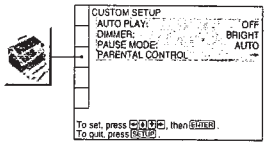
■DIMMER
Adjusts the lighting of the front panel display.
- BRIGHT: makes the front panel display bright.
- DARK: makes the front panel display dark.
- OFF: turns off the lighting of the front panel display.
- AUTO: turns on the front panel display for a few seconds when a button on the player or the remote is pressed.

■PAUSE MODE (DVD only)
Selects the picture in pause mode.
- AUTO: A picture including subjects that move dynamically is output with no jitter. Normally select this position.
- FRAME: A picture including subjects that do not move dynamically is output with high resolution.

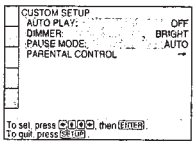
■PARENTAL CONTROL ➡
Sets a password and playback limitation level when you play DVDs with playback limitation for children.
For details, see "Limiting Playback by Children (Parental Control)."

Limiting Playback by Children (Parental Control)

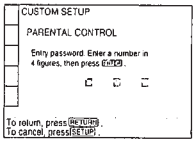
Select "CUSTOM SETUP" after pressing SET UP.
Playing some DVDs can be limited depending on the age of users. The "Parental Control" function allows you to set a playback limitation level.



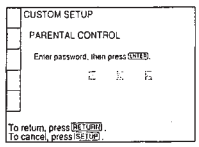
1 Select "PARENTAL CONTROL" using ↑/↓, then press ENTER.



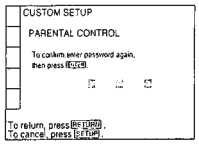
■When you have not entered a password yet
The display for entering a password appears.


CUSTOM SETUP
PARENTAL CONTROL
Entry password. Enter a number in 4 figures, then press ENTER.
To return, press RETURN.
To cancel, press SETUP.

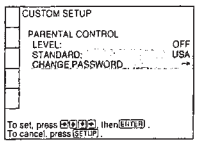
■When you have already entered a password
The display for confirming the password appears. Skip Step 2.



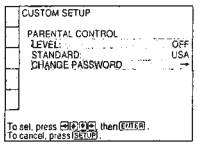
2 Enter a password in 4 digits using the number buttons, then press ENTER.
The digits change to asterisks (*), and the display for confirming the password appears.


CUSTOM SETUP
PARENTAL CONTROL
To confirm, enter password again, then press ENTER.
To return, press SETUP.
To cancel, press SETUP.

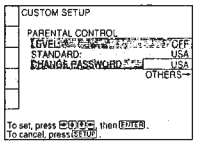
3 To confirm your password, enter it using the number buttons, then press ENTER.
The display for setting the playback limitation level and changing the password appears.



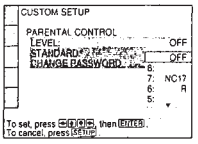
4 Select "STANDARD" using ↑/↓, then press →.



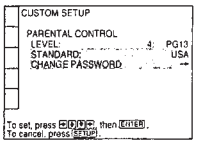
5 Select an area as the standard for playback limitation level using ↑/↓, then press →.
When you select "OTHERS→," select and enter the standard code in the table below using number buttons.



6 Select "LEVEL" using ↑/↓, then press →.



7 Select the level you want using ↑/↓, then press ENTER.



The lower the value is, the more strict the limitation.

To return to the normal screen
Press SET UP.

To turn off the Parental Control function and play the DVD after entering your password
Set "LEVEL" to "OFF" in Step 7, then press ⊳.

To change the password
1 After Step 3, select "CHANGE PASSWORD" using ↑/↓, then press → or ENTER.
The display for changing the password appears.
2 Follow Steps 2 and 3 to enter a new password.

💡 You can turn off the Parental Control function just after inserting the DVD (Parental Control Temporarily Canceled)
When you set a playback limitation level and insert the DVD, the PARENTAL CONTROL display appears. Enter the password to turn off the Parental Control function.
When you stop playing the DVD, the level returns to the original level.

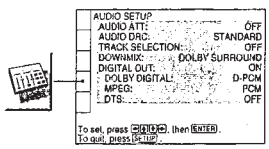
💡 If you have forgot your password
Enter the 6 digits number "199703" in Step 2 to clear the current password. To enter a new password, follow the procedure from Step 2 again.

Notes
- When you play DVDs which do not have the Parental Control function, playback cannot be limited on this player.
- When you do not set a password, you cannot change the settings for playback limitation.
- Depending on the DVD, you may be asked to change the parental control level while playing the disc. In this case, enter the password, then change the level.
When you stop playing the DVD, the level returns to the original level.

Standard	Code number
Austria	2046
Belgium	2057
Canada	2079
China	2092
Denmark	2115
Finland	2165
France	2174
Germany	2109
Hong Kong	2219
Indonesia	2238
Italy	2254
Japan	2276
Malaysia	2363
Netherlands	2376
Norway	2379
Philippines	2424
Russian	2489
Singapore	2501
Spain	2149
Sweden	2499
Switzerland	2086
Taiwan	2543
Thailand	2528
United Kingdom	2184

Settings for Sound (AUDIO SETUP)

Select "AUDIO SETUP" after pressing SET UP.
"AUDIO SETUP" allows you to set the sound according to the playback conditions.
Default settings are underlined.



■AUDIO ATT (attenuation)
Selects the setting of the output from the LINE OUT (AUDIO) connectors according to the audio equipment to be connected.
- OFF: turns off the audio attenuation.
- ON: reduces the audio output level so that no sound distortion occurs.

Note
The setting does not affect the output from the OPTICAL and COAXIAL connectors.

■AUDIO DRC (Dynamic Range Control)
Makes the sound clear with the volume turned down at night, etc., when you play a DVD. This affects the output from the OPTICAL and COAXIAL connectors only when "PCM" in "DIGITAL OUT" is set to "ON," and it affects the output from the LINE OUT (AUDIO) connectors.
- STANDARD: Normally select this position.
- TV MODE: makes the low sound clear even if you turned the volume down, so it is good for playing at night. It is especially recommended when you listen to the sound using the speakers of the TV.
- WIDE RANGE: It gives you the feeling of being at a live performance. When you use high quality speakers, it is more effective.

Notes
- When you play DVDs without the AUDIO DRC function, there may be no effects on the sound.
- When this item is set to "WIDE RANGE," the sound volume may be less than usual.

■TRACK SELECTION
Gives the sound track which contains the highest number of the channels priority when you play a DVD on which multiple audio formats are recorded. If multiple audio channels are recorded in PCM, DTS, MPEG AUDIO or Dolby Digital format, the higher-numbered channel audio recorded in PCM, DTS, MPEG AUDIO or Dolby Digital format is played.
- OFF: No priority given.
- AUTO: Priority given.

Notes
- When you set this item to "AUTO," the language may change depending on the "AUDIO" settings in "LANGUAGE SETUP." The "TRACK SELECTION" setting has higher priority than that of "AUDIO" settings in "LANGUAGE SETUP" (page 45).
- If you set "DTS" in "AUDIO SETUP" to "OFF," the DTS sound track is not played even if you set this item to "AUTO" and the highest-numbered channel audio is recorded in DTS format.
- If PCM, DTS, MPEG AUDIO and Dolby Digital sound tracks have the same number of the highest channels, the player selects PCM, DTS, Dolby Digital and MPEG AUDIO sound tracks, in this order.
- Depending on the DVD, the audio with priority may be predetermined. In this case, you cannot give priority to the DTS, MPEG AUDIO or Dolby Digital format by selecting "AUTO."

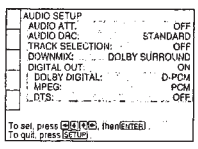
■DOWNMIX*
Switches the mixing down methods when you play a DVD on which 3 or more channels in Dolby Digital format are recorded.
- DOLBY SURROUND: when the player is connected to an audio component that conforms to Dolby Surround (Pro Logic).
- NORMAL: when the player is connected to a normal audio component.

* The setting affects the following connectors:
–LINE OUT (AUDIO) connectors
–OPTICAL and COAXIAL connectors

■DIGITAL OUT
Selects output signals via the OPTICAL and COAXIAL connectors.
- ON: Normally select this position. When you select "ON," set "DOLBY DIGITAL," "MPEG" and "DTS." For details on setting them, see "Setting for the signal to the digital output."
- OFF: when the player does not output the sound signals via the OPTICAL and COAXIAL connectors, if you select this position, the influence of the digital circuit upon the analog one is minimum.

Notes
- When you play the sound tracks with 96 kHz sampling frequency, the output signals from the OPTICAL and COAXIAL connectors are converted to 48 kHz (sampling frequency). When the signals are output from LINE OUT (AUDIO) connectors, sampling frequency stays at 96 kHz and the output signals are converted to analog signals.
- When you select "OFF," you cannot set "DOLBY DIGITAL," "MPEG" and "DTS."

Setting for the signal to the digital output
When you select "ON," set "DOLBY DIGITAL," "MPEG" and "DTS."
Switches the methods of outputting audio signals when you connect a digital component such as a receiver (amplifier) having a digital connector, an audio component having a built-in DTS decoder, a DAT or MD via the OPTICAL or COAXIAL connector using an optical or coaxial digital connecting cord. For details on the connection, see pages 13 and 15.



■DOLBY DIGITAL
Selects output Dolby Digital signals via the OPTICAL and COAXIAL connectors. You cannot select this item when you set "DIGITAL OUT" to "OFF."
- D-PCM (Downmix PCM): when you play the Dolby Digital sound tracks, the output audio signals are mixed down to 2 channels. With the settings of the item "DOWN MIX" in "AUDIO SETUP," you can select whether the signals conform to Dolby Surround (Pro Logic) or not.
- DOLBY DIGITAL: when the player is connected to an audio component with a built-in Dolby Digital decoder.

Note
If the player is connected to an audio component lacking a built-in Dolby Digital decoder, do not set "DOLBY DIGITAL" in "AUDIO SETUP" to "DOLBY DIGITAL." Otherwise, when you play the Dolby Digital sound track, a loud noise or no sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

■MPEG
Selects output MPEG AUDIO signals via the OPTICAL and COAXIAL connectors. You cannot select this item when you set "DIGITAL OUT" to "OFF."
- PCM: when the player is connected to an audio component lacking a built-in MPEG decoder. If you play MPEG AUDIO sound tracks, the player outputs stereo signals taken from MPEG AUDIO signals via the OPTICAL and COAXIAL connectors.
- MPEG: when the player is connected to an audio component having a built-in MPEG decoder.

Note
If the player is connected to an audio component lacking a built-in MPEG decoder, do not set "MPEG" in "AUDIO SETUP" to "MPEG." Otherwise, when you play the MPEG AUDIO sound track, a loud noise will come out from the speakers, affecting your ears or causing the speakers to be damaged.

Note
The player outputs the MPEG analog audio sound only from the front speakers when you set "DIGITAL OUT" in "AUDIO SETUP" to "ON" and then set "MPEG" to "MPEG."

Settings for Sound (AUDIO SETUP)

■DTS

Selects output DTS signals via the OPTICAL and COAXIAL connectors. You cannot select this item when you set "DIGITAL OUT" to "OFF."

- OFF: when the player is connected to an audio component lacking a built-in DTS decoder.
- ON: when the player is connected to an audio component having a built-in DTS decoder.

Note

Select the setting correctly. Otherwise, no sound or strange sound will come out from the speakers, affecting your ears or causing the speakers to be damaged.

• Do not play the DTS sound tracks without connecting the player to an audio component having a built-in DTS decoder. You cannot hear the DTS sound unless you connect the player to an audio component having a built-in DTS decoder.
• When you play the DTS sound track on a CD, a loud noise may come out from the LINE OUT (AUDIO) and PHONES connectors, affecting your ears or causing the speakers or headphones to be damaged.
• When you play the DTS sound track on a DVD, no sounds will come out from the LINE OUT (AUDIO) and PHONES connectors.

Notes on playing the DTS sound tracks on a CD

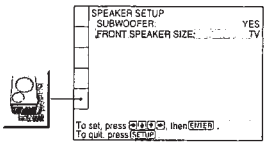
- Do not play the DTS sound tracks without connecting the player to an audio component having a built-in DTS decoder. The player outputs the DTS signal via the OPTICAL and COAXIAL connectors even if "DTS" in "AUDIO SETUP" is set to "OFF" in the setup display, affecting your ears or causing the speakers to be damaged.
- The DTS indicator on the front panel does not light up even if the player outputs DTS signal via the OPTICAL and COAXIAL connectors.
- Set the sounds to "STEREO" when you play the DTS sound tracks on a CD. (See "Changing the Sounds" on page 32.) If you set the sounds to "1/L" or "2/R," no sounds will come out from the OPTICAL and COAXIAL connectors.

Notes on playing the DTS sound tracks on a DVD

- No sounds will come out from the LINE OUT (AUDIO) and PHONES connectors.
- If the player is connected to an audio component lacking a built-in DTS decoder, do not set "DTS" in "DIGITAL OUT" to "ON" in the setup display. Otherwise, when you play the DTS sound track, a loud noise will come out from the speakers, affecting your ears or causing the speakers to be damaged.
- When you set "DTS" in "AUDIO SETUP" to "OFF," no sound will come out from the OPTICAL and COAXIAL connectors even if you play DTS sound tracks on DVDs.
- The DTS indicator on the front panel display lights up when you play DTS sound tracks.

Speaker Set Up

Select "SPEAKER SETUP" after pressing SET UP.
When you have connected a subwoofer, specify the size of the front speakers you have connected to change the frequency range output from the subwoofer so that you can obtain the best possible surround sound.
Even if you change the setting of "SUBWOOFER" or "FRONT SPEAKER SIZE," the sound output from the front speakers do not change.
For the speaker hookups, see pages 12 and 14.



■SUBWOOFER

Selects whether a subwoofer is connected to the player or not.

- NONE: When a subwoofer is not connected to the player.
- YES: When a subwoofer is connected to the player, you can select the output level from the subwoofer in "FRONT SPEAKER SIZE" according to the front speakers you are using.

■FRONT SPEAKER SIZE:

Selects the size of the connected front speakers. The frequency range output from the subwoofer varies according to the size of the front speakers.
You cannot select this item when you set "SUBWOOFER" to "NONE."

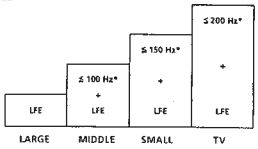
- LARGE: If you connect large speakers that will effectively reproduce bass frequencies, and play a DVD recorded in 5 channel including LFE signal, select this. If you feel a lack of bass frequencies from the front speakers when you select this, select "MIDDLE."

Note

If LFE signal is not recorded in the disc, no sound will be output from the subwoofer even if you select "LARGE."

- MIDDLE: If you connect large speakers that will effectively reproduce bass frequencies and play a source on which LFE signal is not recorded, select this to output the bass frequencies in the front channel also from the subwoofer.
  If you feel a lack of bass frequencies from the front speakers when you select this, select "SMALL."
- SMALL: If the sound is distorted, or you feel a lack of surround effects, select this to output the bass frequencies, which the front speakers cannot output, from the subwoofer.
  If you feel a lack of bass frequencies from the front speakers when you select this, select "TV."
- TV: If you do not connect front speakers, select this to output the bass frequencies from the subwoofer.
  If you connect small speakers, select this.

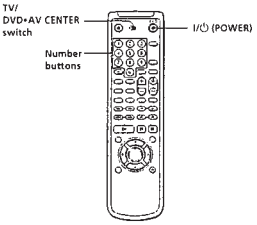
The subwoofer outputs LFE signal and the frequency range shown below depending on the FRONT SPEAKER SIZE setting
The LFE signal is output only when the disc contains the LFE signal.



* Audio signal besides LFE

Controlling the TV or the AV Receiver (Amplifier) with the Supplied Remote

If you adjust the remote signal, you can control your TV with the supplied remote. Default setting is to control Sony TVs with the ⊡ mark.
When you connect the player to a Sony AV receiver (amplifier), you can also set the input of the receiver (amplifier) to this player with the supplied remote.



Controlling TVs with the remote

1 Slide the TV/DVD•AV CENTER switch to TV.

2 Hold down I/⏻ (POWER), and enter your TV's manufacturer's code (see the table) using the number buttons. Then release I/⏻ (POWER).

Code numbers of controllable TVs

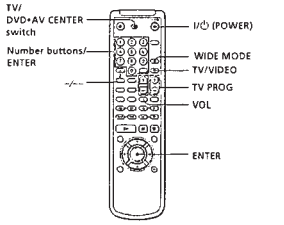
If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

Notes

- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number may reset to 01 (Sony). Reset the appropriate code number.

Manufacturer	Code number
Sony (default)	01
Grundig	11
Hitachi	24
Loewe	45
Nokia	15, 16, 69
Panasonic	17, 49
Philips	06, 07, 08
Saba	12, 13
Samsung	22, 23
Sanyo	25
Sharp	29
Telefunken	36
Thomson	43
Toshiba	38

When you set the TV/DVD•AV CENTER switch to TV, you can control your TV using the keys below.



By pressing	You can
I/⏻ (POWER)	Turn the TV on or off
TV/VIDEO	Select the input source for the TV between the TV and VCR
VOL	Adjust the volume of the TV
TV PROG	Select the program position of the TV
WIDE MODE	Switch the wide picture on or off
Number buttons and ENTER	Select the program position of the TV

Notes

- Depending on the TV, you may not be able to control your TV or to use some of the buttons above.
- If you use number buttons to select program position of the TV, press -/-- followed by the number buttons for two-digit numbers.

Controlling an AV receiver (amplifier) with the remote

1 Slide the TV/DVD•AV CENTER switch to DVD•AV CENTER.

2 Hold down I/⏻ (POWER), and enter your AV receiver's manufacturer's code (see the table below) using the number buttons. Then release I/⏻ (POWER).

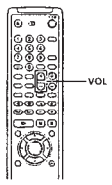
Manufacturer	Code number
Sony	91 (default), 88, 89
Denon	84, 85, 86
Kenwood	92, 93
Onkyo	81, 82, 83
Pioneer	99
Sunsui	87
Technics	97, 98
Yamaha	94, 95, 96
-	90*

* By setting the code number 90, you can adjust the volume of the TV even if the TV/DVD•AV CENTER switch is on the DVD•AV CENTER side, if you do not control an AV receiver (amplifier) with the remote.

Code numbers of controllable receivers (amplifiers)

If more than one code number is listed, try entering them one at a time until you find the one that works with your receiver (amplifier).

You can also change the sound volume of the AV receiver (amplifier) using VOL.



Note

Depending on the AV receiver (amplifier), you may not be able to control your AV receiver (amplifier).

Self-diagnosis Function

When the self-diagnosis function works to prevent the player from malfunctioning, a five-character service number (combination of a letter and digits) flashes on the front panel display. In this case, check the following table.

First three characters	Cause and/or Corrective Action
C13	• The disc is dirty. ➡Clean the disc with a cleaning cloth (page 7).
C31	• The disc is not inserted correctly. ➡Insert the disc correctly.
Exx (xx is any number)	• To prevent the player from malfunctioning, the self-diagnosis function has worked. ➡When you contact your Sony dealer or local authorized Sony service facility, give the 5-character service number. (example: E:61:10)

Language Code List

For details, see pages 33 and 45.

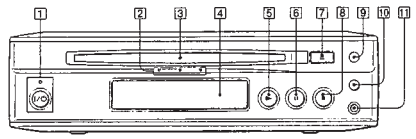
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1186	Scots Gaelic	1350	Malayalam	1513	Siswati
1028	Abkhazian	1194	Galician	1352	Mongolian	1514	Sesotho
1032	Afrikaans	1196	Guarani	1353	Moldavian	1515	Sundanese
1039	Amharic	1203	Gujarati	1356	Marathi	1516	Swedish
1044	Arabic	1209	Hausa	1357	Malay	1517	Swahili
1045	Assamese	1217	Hindi	1358	Maltese	1521	Tamil
1051	Aymara	1226	Croatian	1363	Burmese	1525	Telugu
1052	Azerbaijani	1229	Hungarian	1365	Nauru	1527	Tajik
1053	Bashkir	1233	Armenian	1369	Nepali	1528	Thai
1057	Byelorussian	1235	Interlingua	1376	Dutch	1529	Tigrinya
1059	Bulgarian	1239	Interlingue	1379	Norwegian	1531	Turkmen
1060	Bihari	1245	Inupiak	1393	Occitan	1532	Tagalog
1061	Bislama	1248	Indonesian	1403	(Afan) Oromo	1534	Setswana
1066	Bengali; Bangla	1253	Icelandic	1408	Oriya	1535	Tonga
1067	Tibetan	1254	Italian	1417	Punjabi	1538	Turkish
1070	Breton	1257	Hebrew	1428	Polish	1539	Tsonga
1079	Catalan	1261	Japanese	1435	Pashto, Pushto	1540	Tatar
1093	Corsican	1269	Yiddish	1436	Portuguese	1543	Twi
1097	Czech	1283	Javanese	1463	Quechua	1557	Ukrainian
1103	Welsh	1287	Georgian	1481	Rhaeto-Romance	1564	Urdu
1105	Danish	1297	Kazakh	1482	Kirundi	1572	Uzbek
1109	German	1298	Greenlandic	1483	Romanian	1581	Vietnamese
1130	Bhutani	1299	Cambodian	1489	Russian	1587	Volapük
1142	Greek	1300	Kannada	1491	Kinyarwanda	1613	Wolof
1144	English	1301	Korean	1495	Sanskrit	1632	Xhosa
1145	Esperanto	1305	Kashmiri	1498	Sindhi	1665	Yoruba
1149	Spanish	1307	Kurdish	1501	Sangho	1684	Chinese
1150	Estonian	1311	Kirghiz	1502	Serbo-Croatian	1697	Zulu
1151	Basque	1313	Latin	1503	Singhalese	1703	Not specified
1157	Persian	1326	Lingala	1505	Slovak		
1165	Finnish	1327	Laothian	1506	Slovenian		
1166	Fiji	1332	Lithuanian	1507	Samoan		
1171	Faroese	1334	Latvian; Lettish	1508	Shona		
1174	French	1345	Malagasy	1509	Somali		
1181	Frisian	1347	Maori	1511	Albanian		
1183	Irish	1349	Macedonian	1512	Serbian		

Index to Parts and Controls

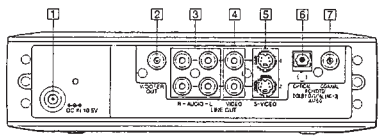
Refer to the pages indicated in parentheses for details.

Front Panel



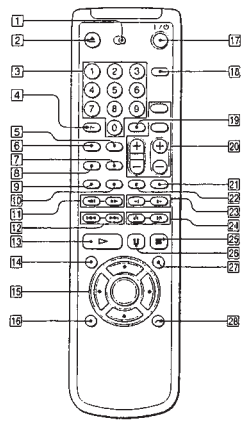
1 **I/⏻ (POWER) button and indicator (18)**
Turns on and off the power of the player.
2 **Disc type indicator (18)**
Lights up when the corresponding disc was inserted.
3 **Disc slot (18)**
Insert a disc.
4 **Front Panel Display (24)**
Indicates the playing time, etc.
5 **⏵PLAY button and indicator (18)**
Plays a disc.
6 **⏸PAUSE button and indicator (19)**
Pauses playing a disc.
7 **⏏EJECT button (19)**
Ejects the disc.
8 **■STOP button (19, 21)**
Stops playing a disc.
9 **⊡ (remote sensor) (8)**
Accepts the remote control signals.
10 **PHONES LEVEL control (18)**
Press and adjust the headphone volume. After adjusting, press it again.
11 **PHONES connector (18)**
Connect the headphones to this connector.

Rear Panel



1 **DC IN 10.5 V jack (10, 12, 14, 16)**
Connects the supplied AC power adaptor.
2 **WOOFER OUT connector (14)**
Connects to a subwoofer (not supplied).
3 **LINE OUT (AUDIO) connectors (10, 12, 14)**
Connect to the audio input connector on the TV or receiver (amplifier).
4 **LINE OUT (VIDEO) connector (10)**
Connects to the video input connector on the TV or monitor.
5 **LINE OUT (S-VIDEO) connector (10, 12, 14)**
Connects to the S video input connector on the TV or monitor.
6 **OPTICAL connector (13, 16)**
Connects to an audio component using the optical digital connecting cord.
7 **COAXIAL connector (13, 16)**
Connects to an audio component using the coaxial digital connecting cord.

Remote

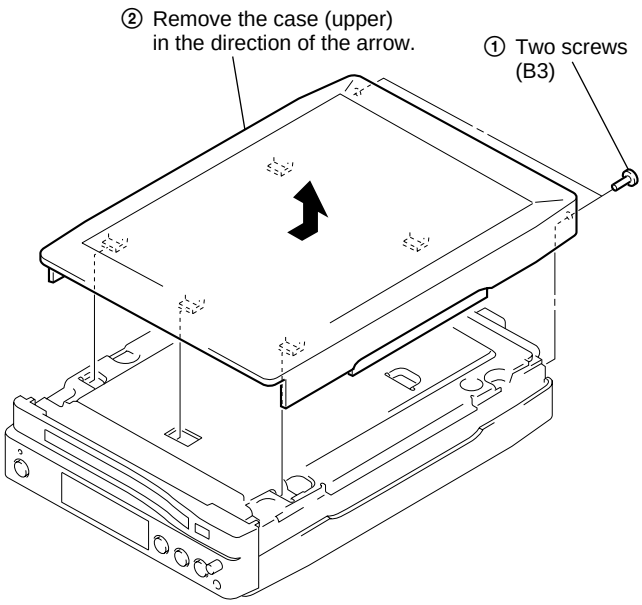


1 TV/DVD•AV CENTER switch (54)
Selects to control the player, the TV or the receiver (amplifier) with the remote.
2 ⏏ (eject) button (19)
Ejects the disc.
3 Number buttons
Select the items or settings.
4 CLEAR/ –/– – (ten's digit) button (37, 38, 39, 40)
Press to return to the Continuous play, etc.
5 REPEAT button (39)
Displays the "REPEAT" display on the TV screen.
6 SHUFFLE button (38)
Displays the "SHUFFLE" display on the TV screen.
7 A↔B button (40)
Displays the "A↔B REPEAT" display on the TV screen.
8 PROGRAM button (37)
Displays the "PROGRAM" display on the TV screen.
9 AUDIO button (32)
Changes the sound while playing a DVD or VIDEO CD.
10 ANGLE button (34)
Changes the angles when playing a DVD.
11 ◄II/II► STEP buttons (20)
Play a disc frame by frame.
12 I◄◄ /►►IPREV/NEXT buttons (19)
Press to go to the next chapter or track or to go back to the previous chapter or track.
13 ▷PLAY button (19)
Plays a disc.
14 TITLE button (22)
Displays the title menu on the TV screen.
15 ←/↑/↓/→/ENTER button
Selects and executes the items or settings.
16 DISPLAY button (26)
Displays the Control Menu display on the TV screen to set or adjust the items.
17 I/⏻ (POWER) button (19)
Turns on and off the power of the player and TV.
18 SET UP button (42)
Displays the setup display on the TV screen to set or adjust the items.
19 ENTER button
Executes the items or settings.
20 TV/receiver (amplifier) operation buttons (55)
Controls TVs and receivers (amplifiers).
21 TIME/TEXT button (24)
Displays the playing time of the disc, etc., on the front panel display.
22 SUBTITLE button (33)
Displays the "SUBTITLE" menu in the Control Menu display.
23 ◄II/II► SLOW buttons (20)
Play a disc in slow motion.
24 ⊟/⊞ SCAN buttons (19, 20)
Locate a point while monitoring the picture.
25 ■STOP button (19, 21)
Stops playing a disc.
26 IIPAUSE button (19)
Pauses playing a disc.
27 DVD MENU button (22)
Displays the DVD menu on the TV screen.
28 ↶RETURN button (23, 27)
Press to return to the previously selected screen, etc.

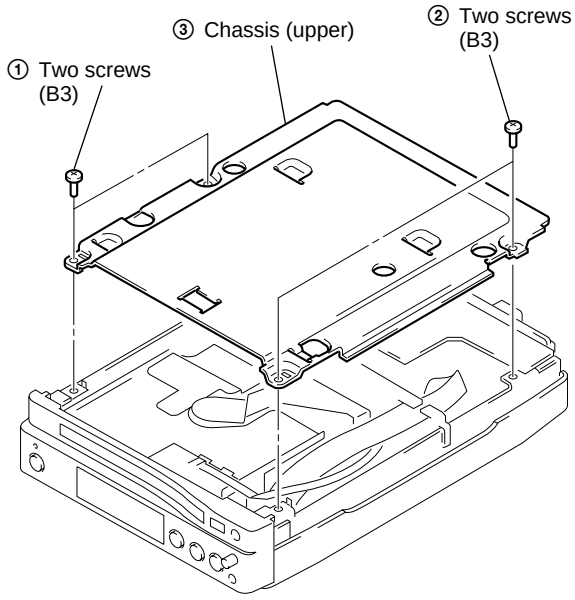
SECTION 2
DISASSEMBLY

Note: Follow the disassembly procedure in the numerical order given.

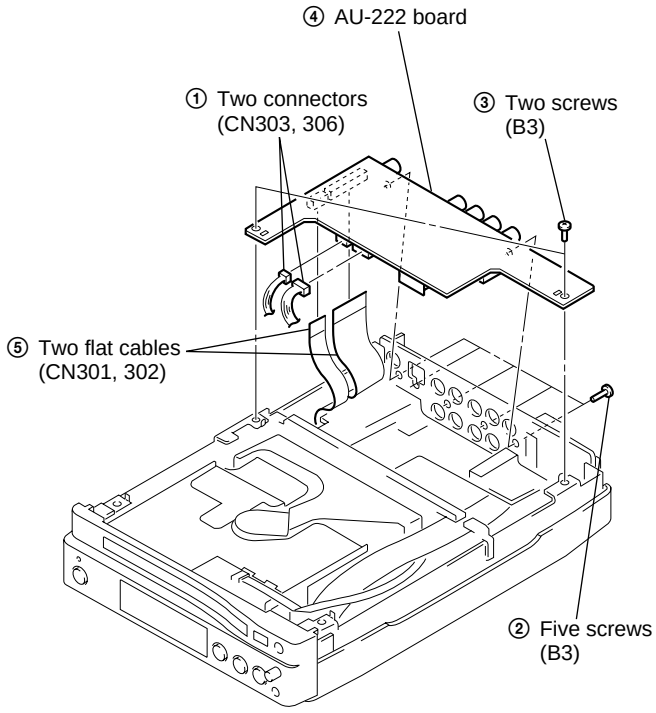
2-1. CASE (UPPER) REMOVAL



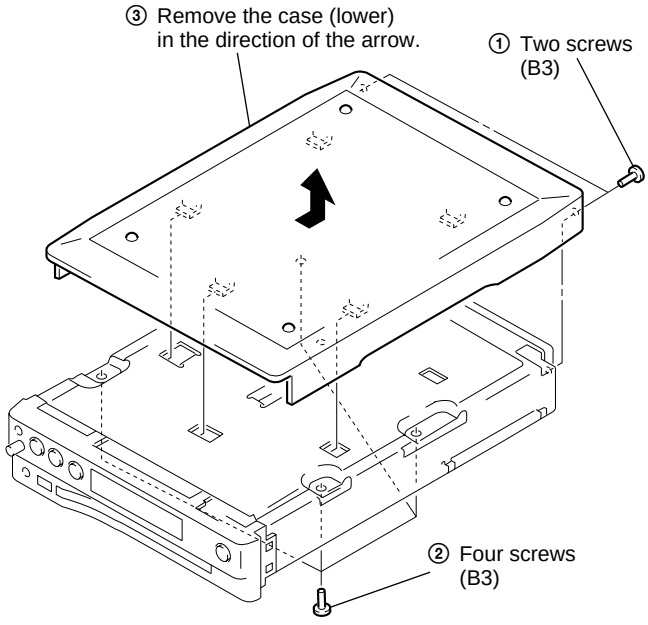
2-2. CHASSIS (UPPER) REMOVAL



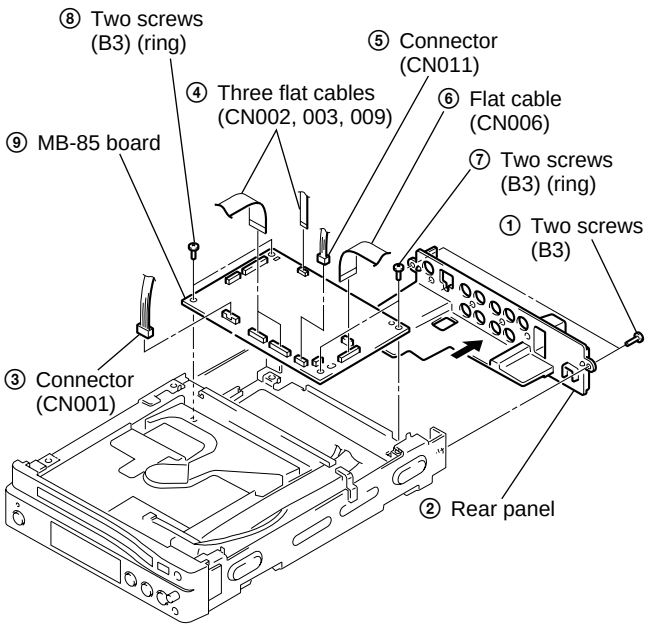
2-3. AU-222 BOARD REMOVAL



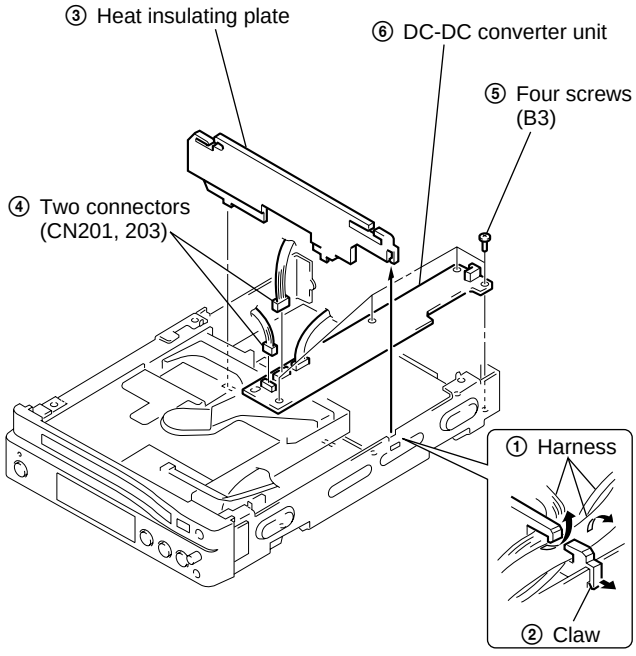
2-4. CASE (LOWER) REMOVAL



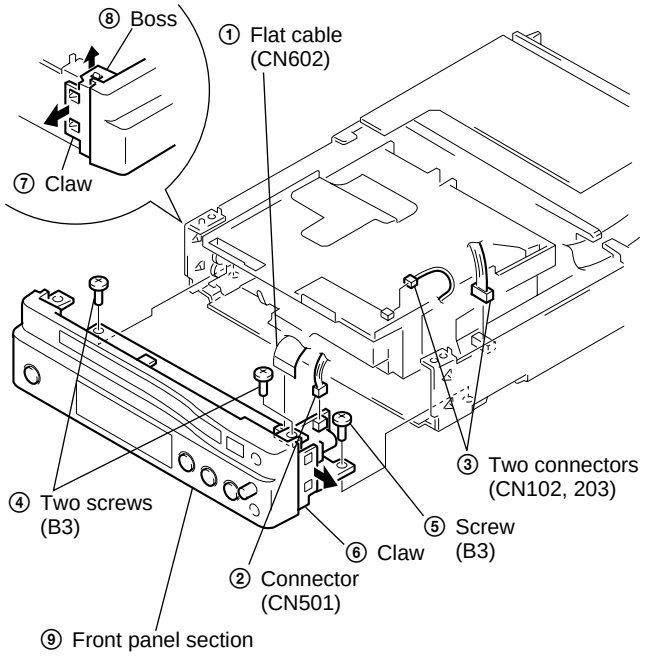
2-5. REAR PANEL, MB-85 BOARD REMOVAL


⑧ Two screws (B3) (ring)
⑤ Connector (CN011)
④ Three flat cables (CN002, 003, 009)
⑥ Flat cable (CN006)
⑨ MB-85 board
⑦ Two screws (B3) (ring)
① Two screws (B3)
③ Connector (CN001)
② Rear panel

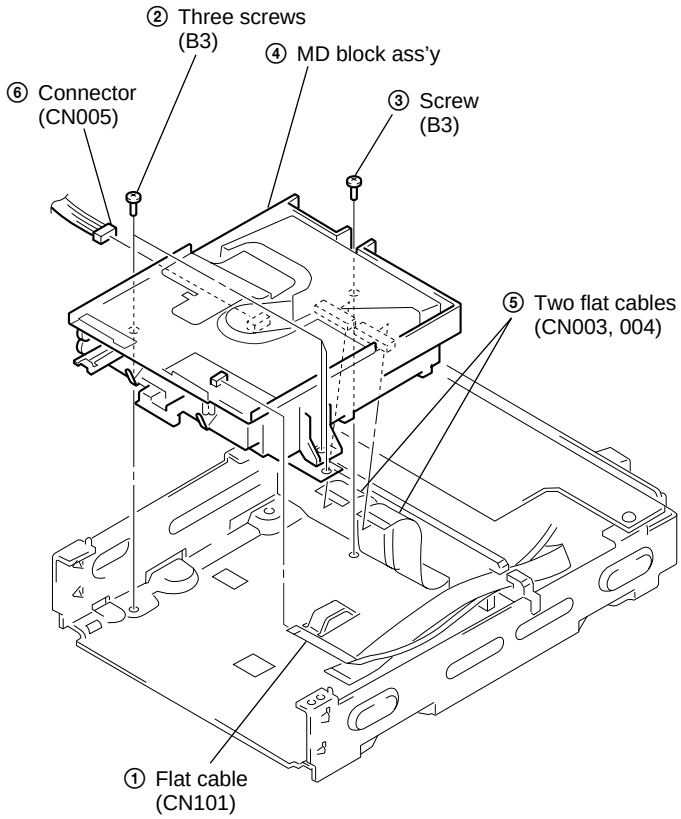
2-6. DC-DC CONVERTER UNIT REMOVAL



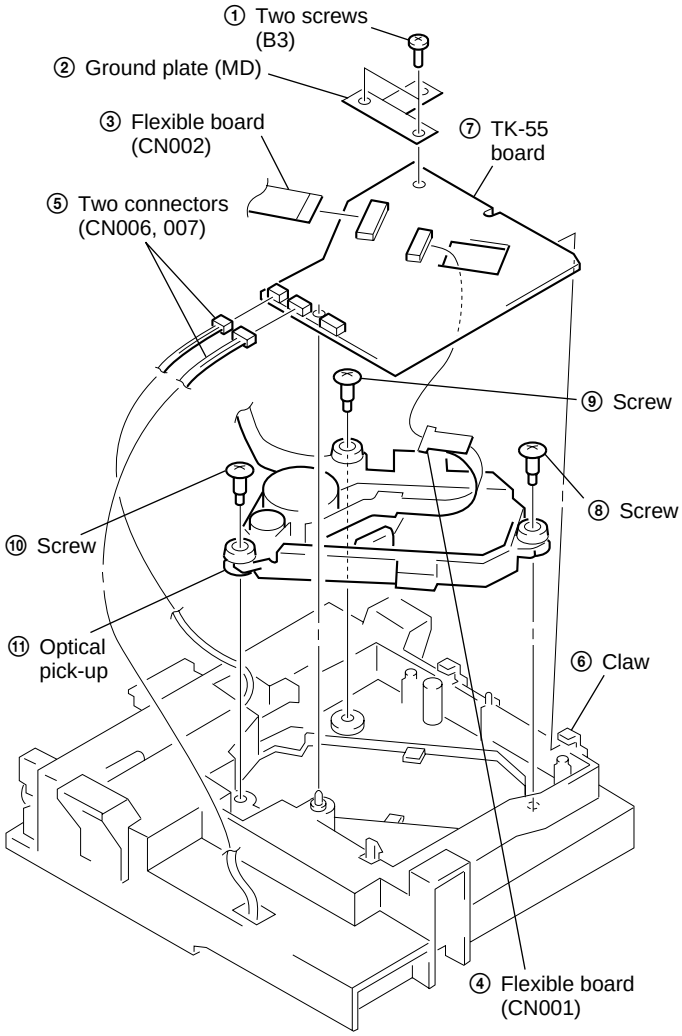
2-7. FRONT PANEL SECTION REMOVAL



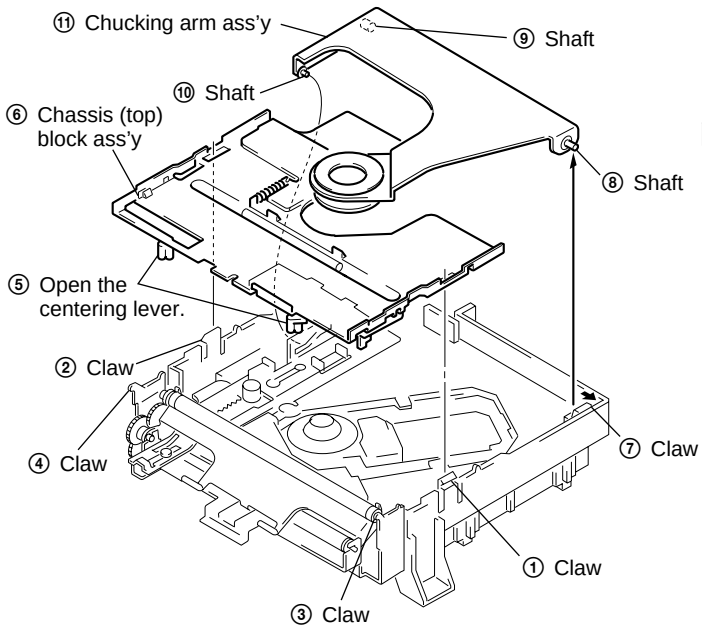
2-8. MD BLOCK ASS'Y REMOVAL



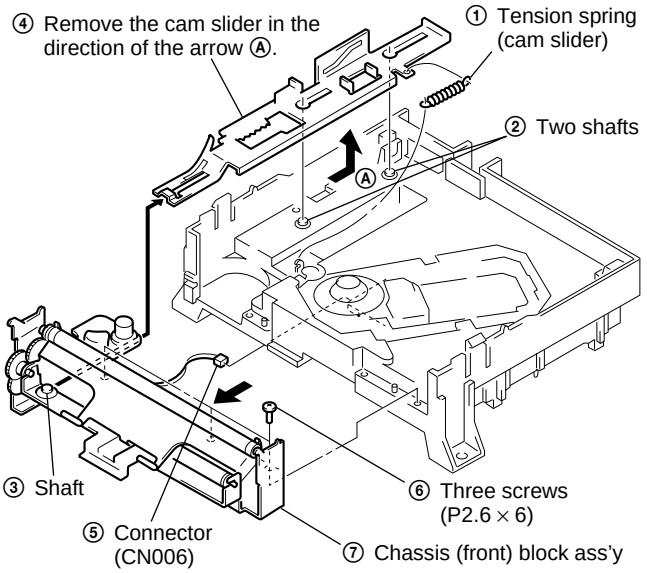
2-9. TK-55 BOARD, OPTICAL PICK-UP REMOVAL



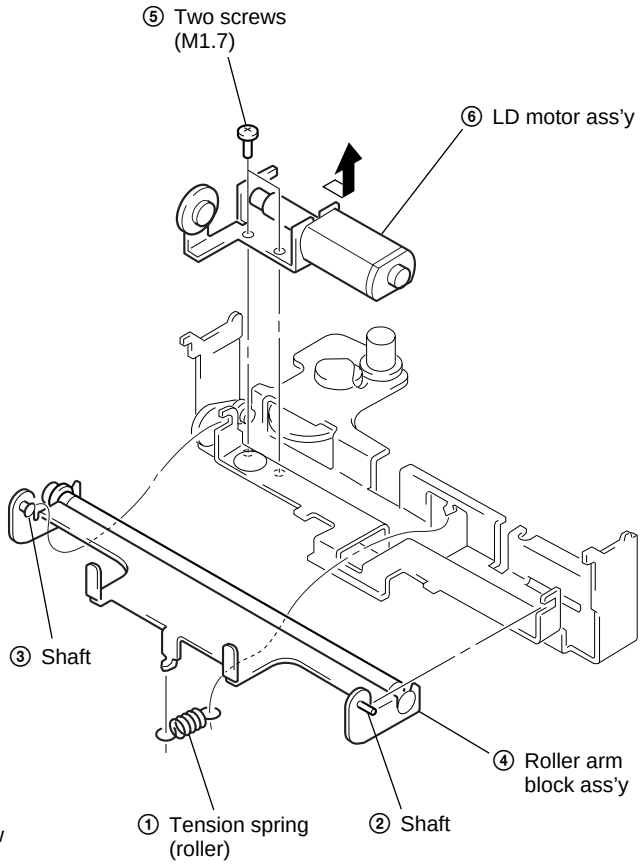
2-10. CHASSIS (TOP) BLOCK ASS'Y, CHUCKING ARM ASS'Y REMOVAL



2-11. CAM SLIDER, CHASSIS (FRONT) BLOCK ASS'Y REMOVAL


④ Remove the cam slider in the direction of the arrow Ⓐ.
① Tension spring (cam slider)
② Two shafts
Ⓐ
③ Shaft
⑥ Three screws (P2.6 × 6)
⑤ Connector (CN006)
⑦ Chassis (front) block ass'y

2-12. ROLLER ARM BLOCK ASS'Y, LD MOTOR ASS'Y REMOVAL

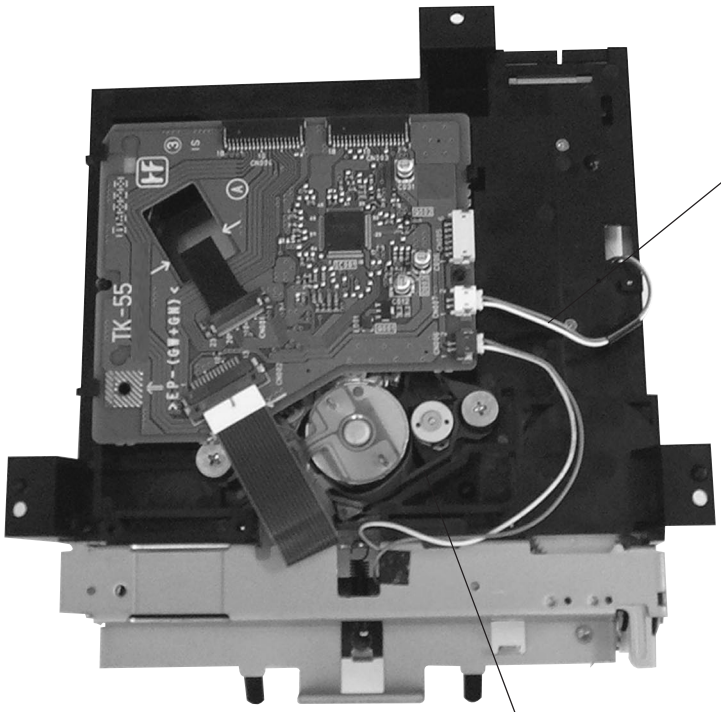


2-13. INTERNAL VIEWS

Switch (chuck sensor)
1-570-771-21

LD motor ass'y
(loading)
A-4608-416-A

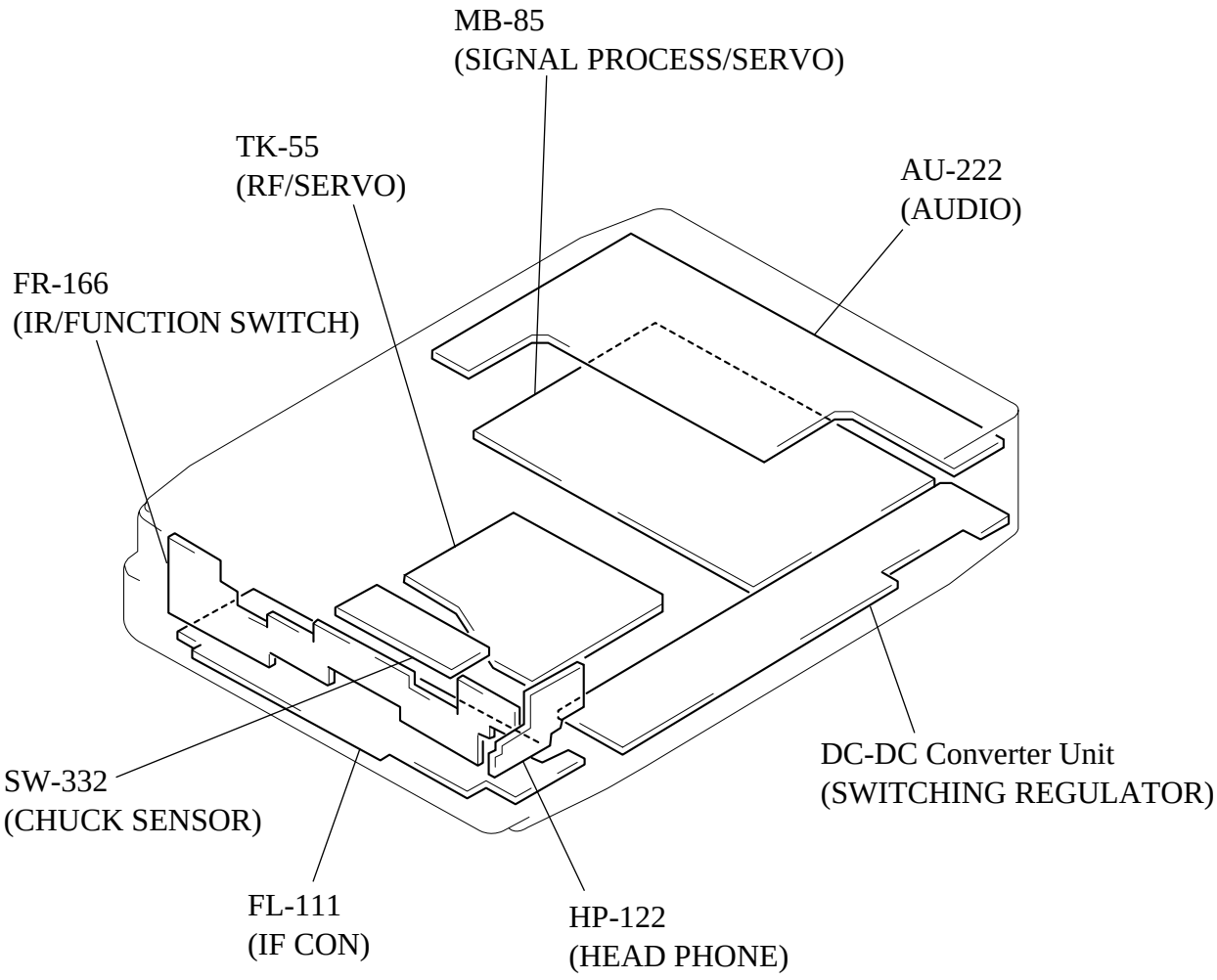
Optical pick-up
(KHM-220AAA/J1RP)
8-820-081-03



Harness (ST-117)
1-960-020-11

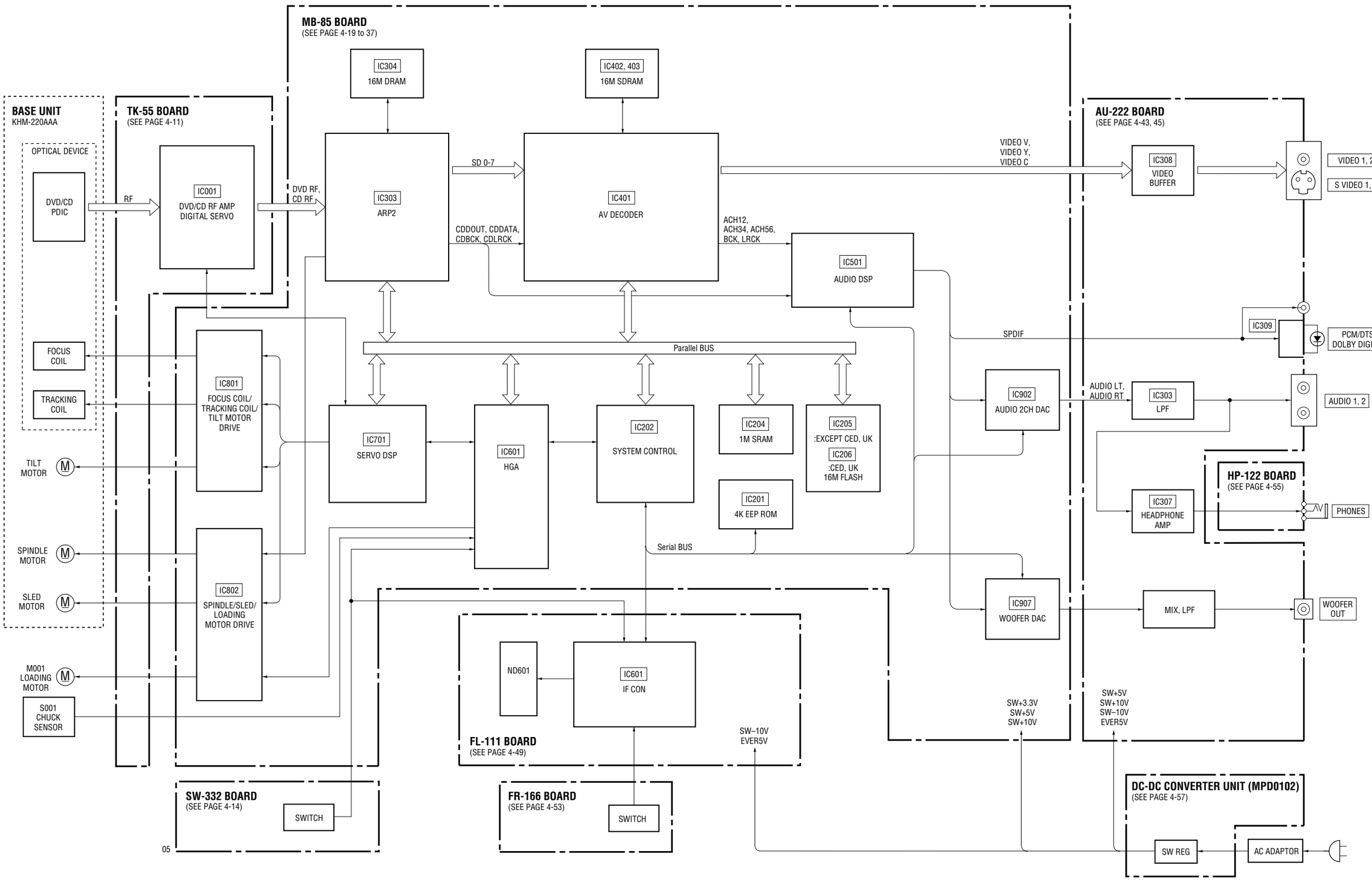
Optical pick-up
(KHM-220AAA/J1RP)
8-820-081-03

2-14. CIRCUIT BOARDS LOCATION

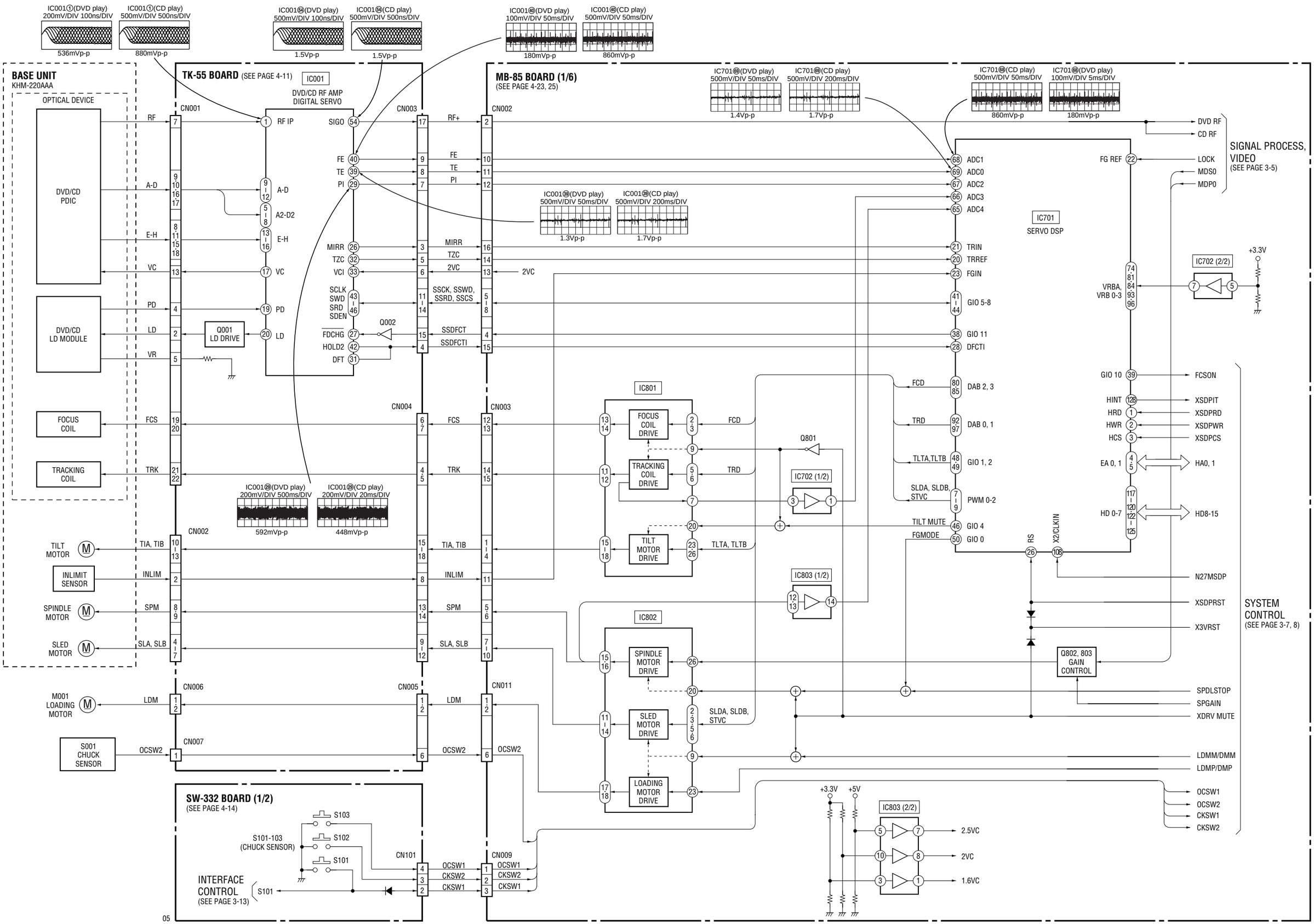


SECTION 3
BLOCK DIAGRAMS

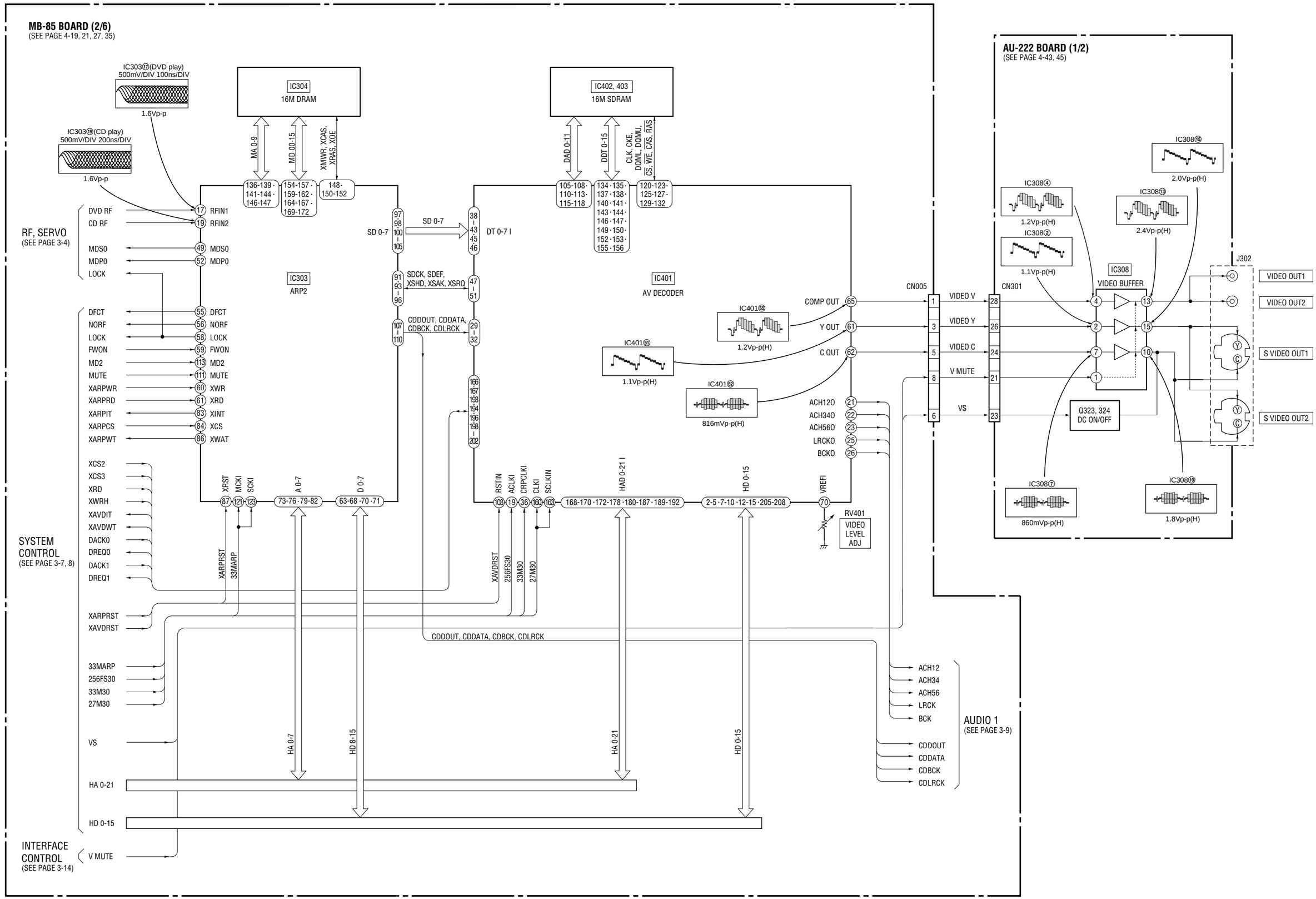
3-1. OVERALL BLOCK DIAGRAM



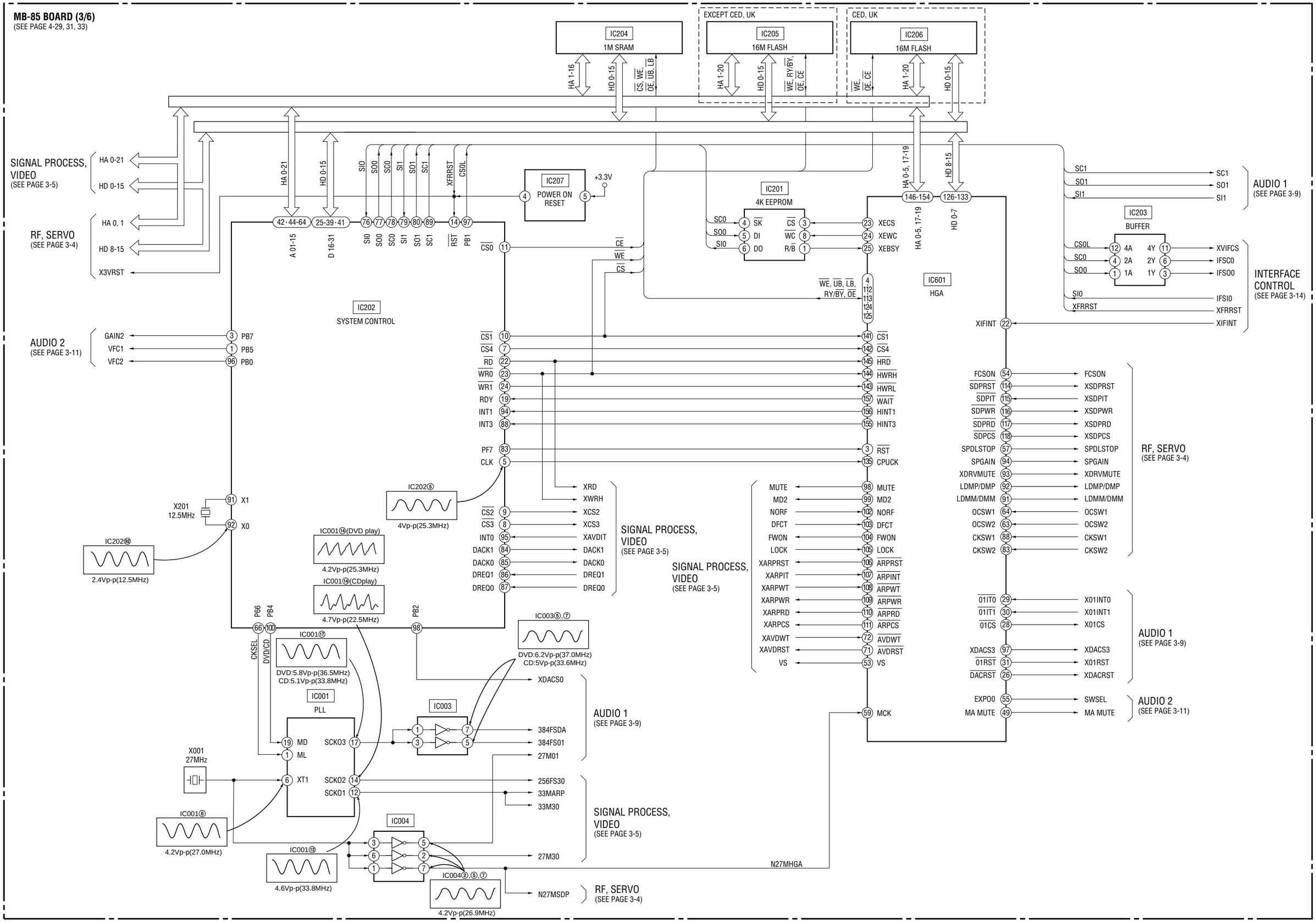
3-2. RF/SERVO BLOCK DIAGRAM



3-3. SIGNAL PROCESS/VIDEO BLOCK DIAGRAM

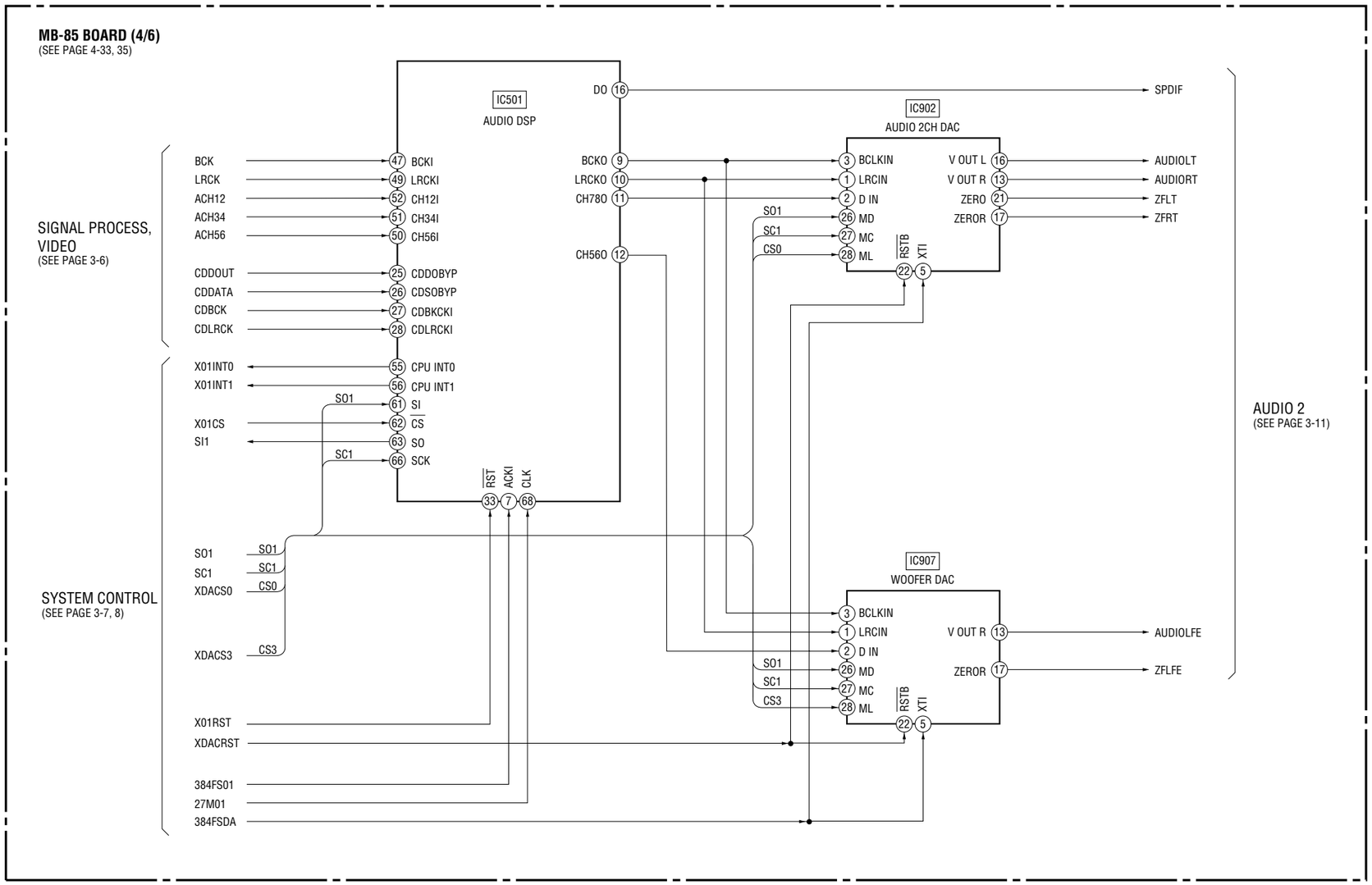


3-4. SYSTEM CONTROL BLOCK DIAGRAM

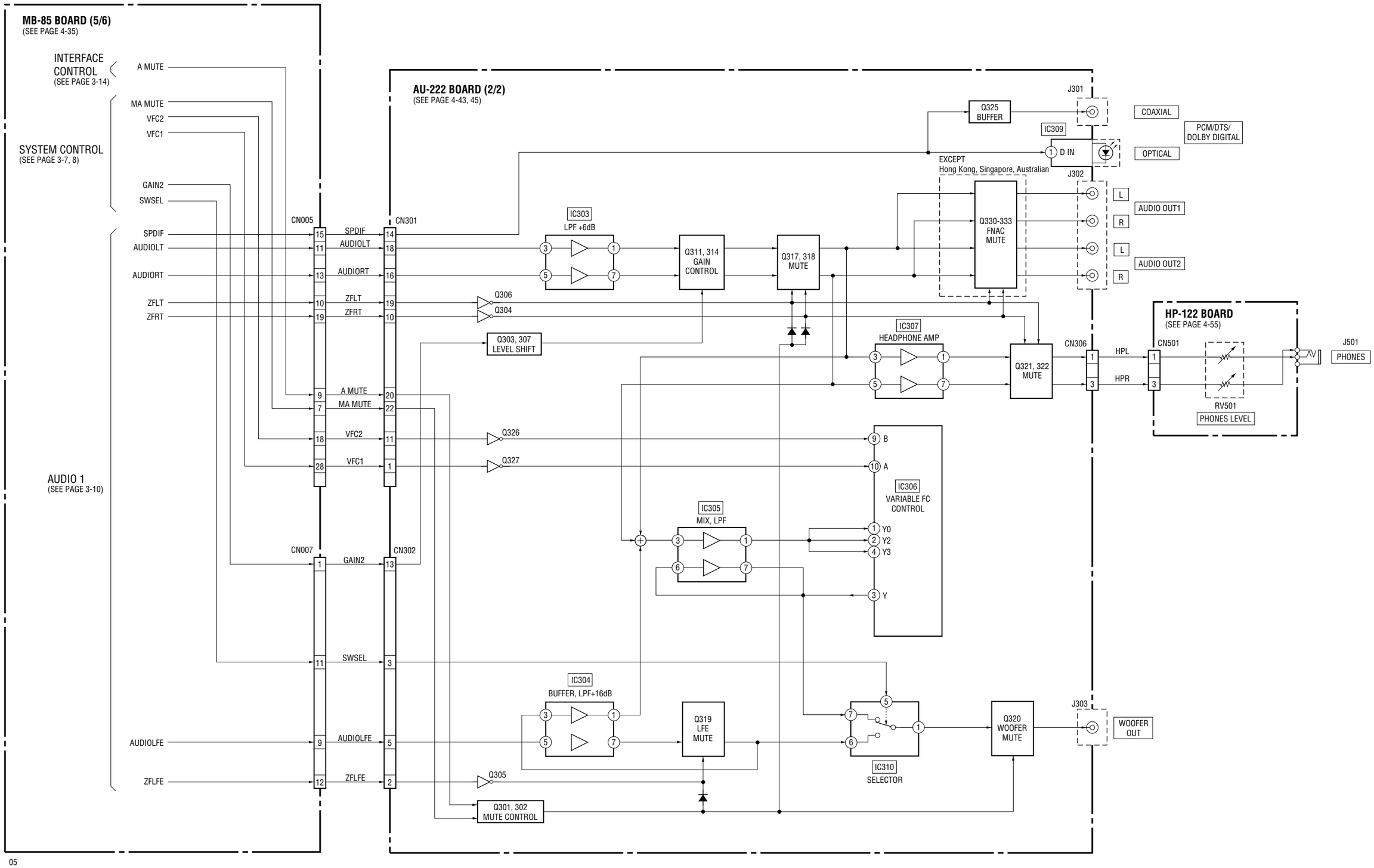


05

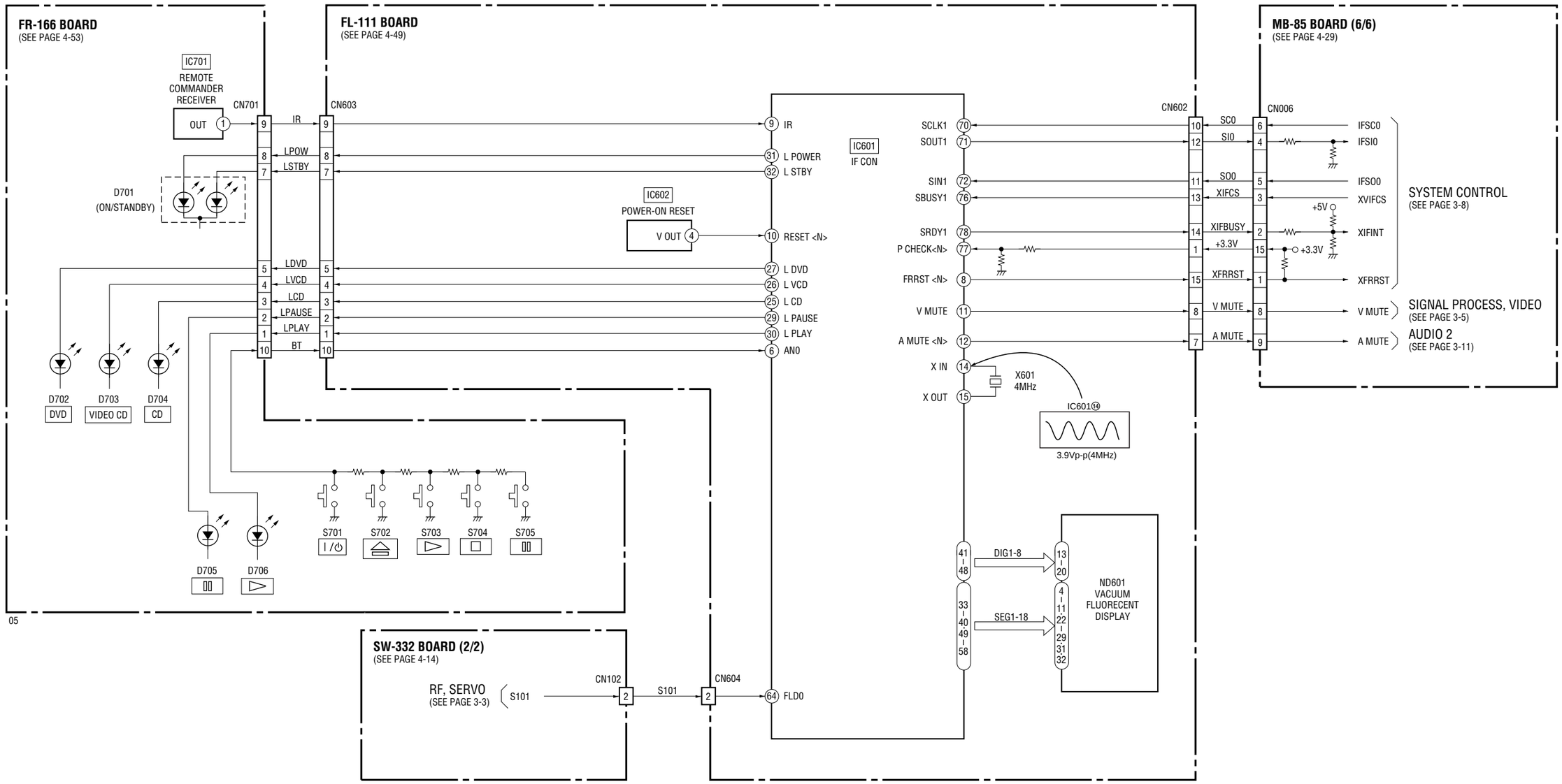
3-5. AUDIO (1) BLOCK DIAGRAM



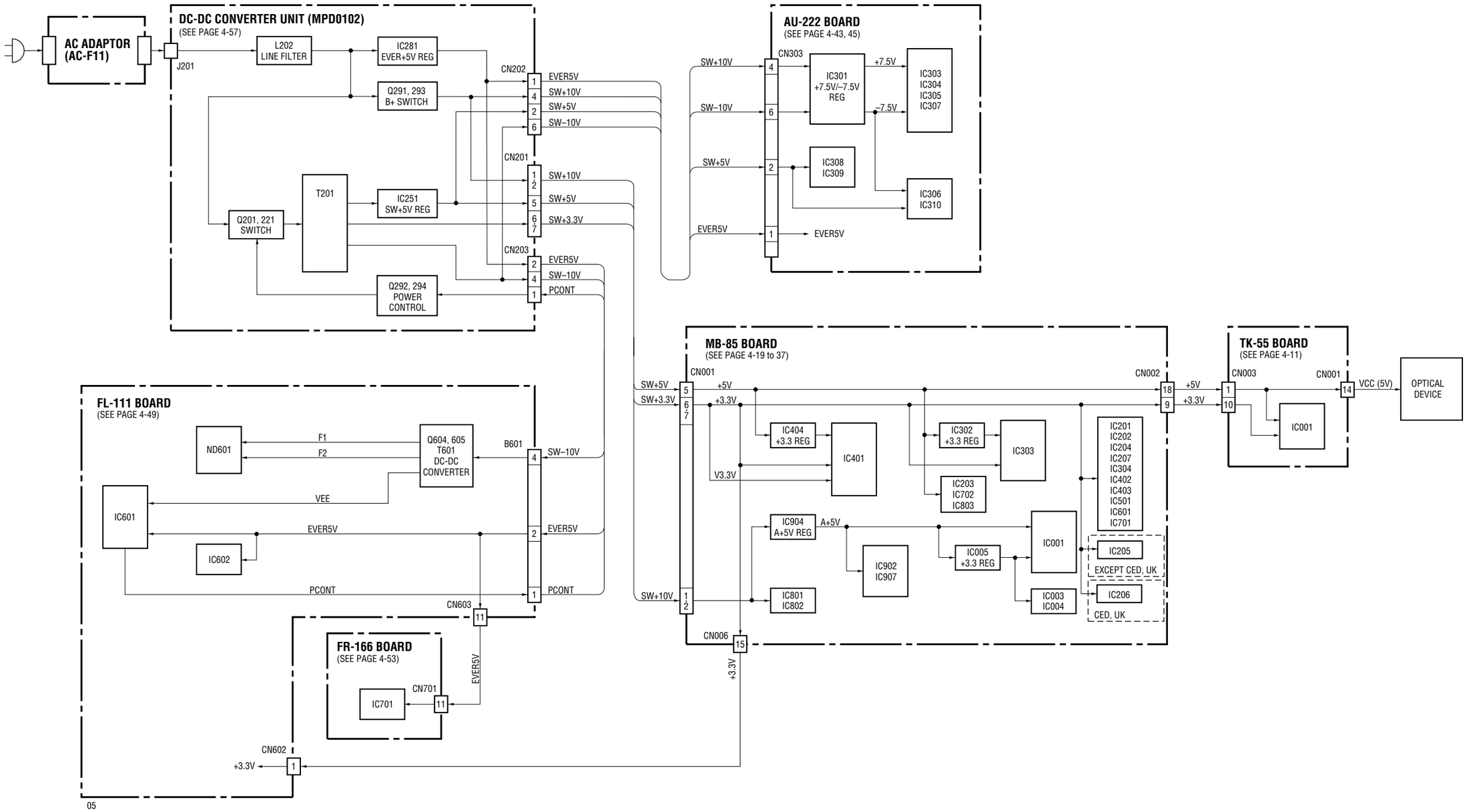
3-6. AUDIO (2) BLOCK DIAGRAM



3-7. INTERFACE CONTROL BLOCK DIAGRAM



3-8. POWER BLOCK DIAGRAM



SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For printed wiring boards:

- ○——— : indicates a lead wire mounted on the component side.
- ●——— : indicates a lead wire mounted on the printed side.
- ○ : Through hole.
- ▒▒▒ : Pattern from the side which enables seeing.

(The other layers' patterns are not indicated.)

Caution:	
Pattern face side: (Side B)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Side A)	Parts on the parts face side seen from the parts face are indicated.

For schematic Diagram:

- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4 W (Chip resistors : 1/10 W) unless otherwise specified.
  kΩ : 1000 Ω, MΩ : 1000 kΩ.
- All capacitors are in µF unless otherwise noted. pF : µµF 50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- △ : internal component.
- : adjustment for repair.
- B+ : B+ Line.
- B− : B– Line.
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD reference disc and when playing CD reference disc.
- Readings are taken with a digital multimeter (DC 10 MΩ).
- Voltage variations may be noted due to normal production tolerances.

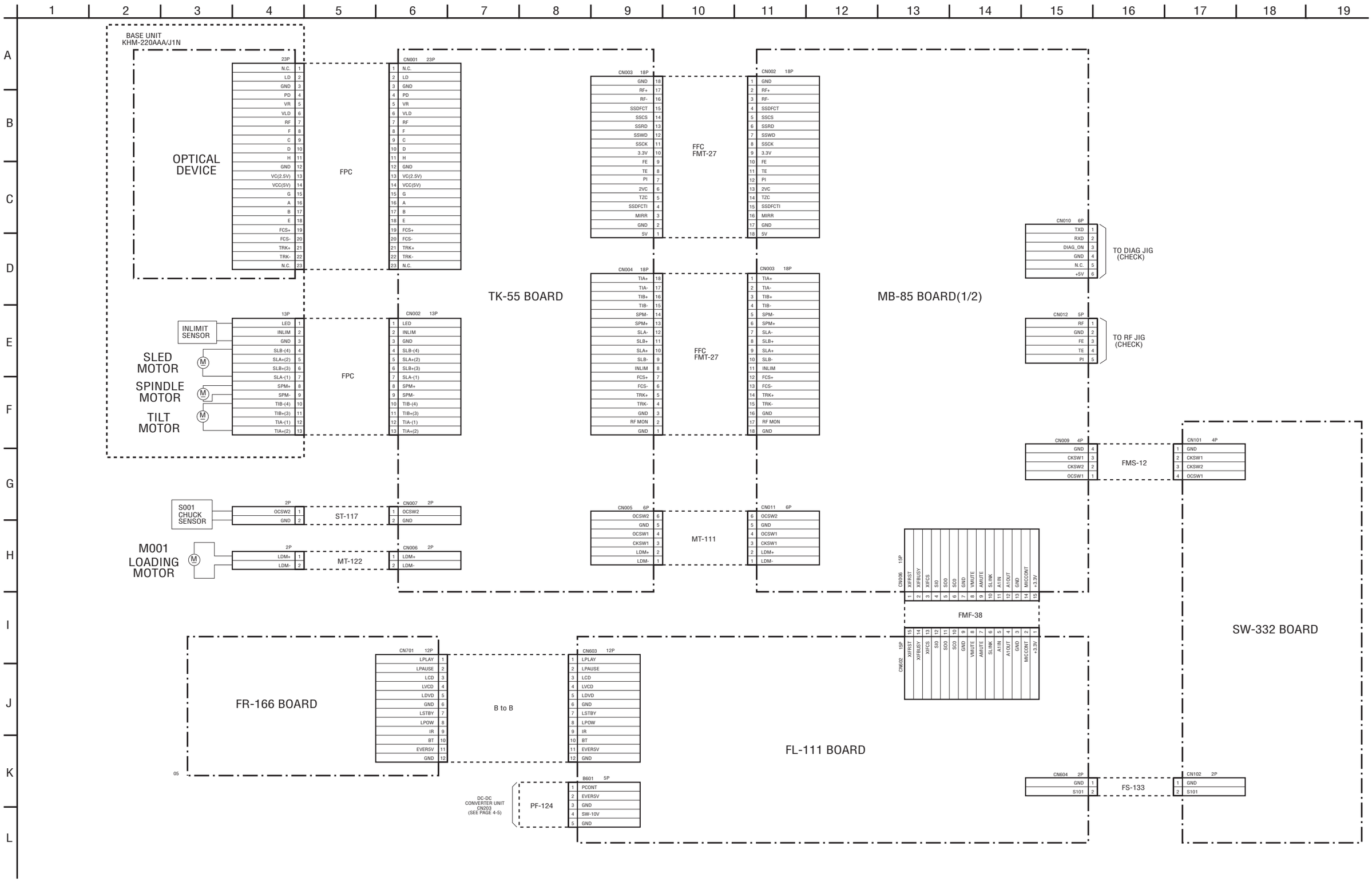
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Abbreviation
  AUS : Australian model
  HK : Hong Kong model
  SP : Singapore model

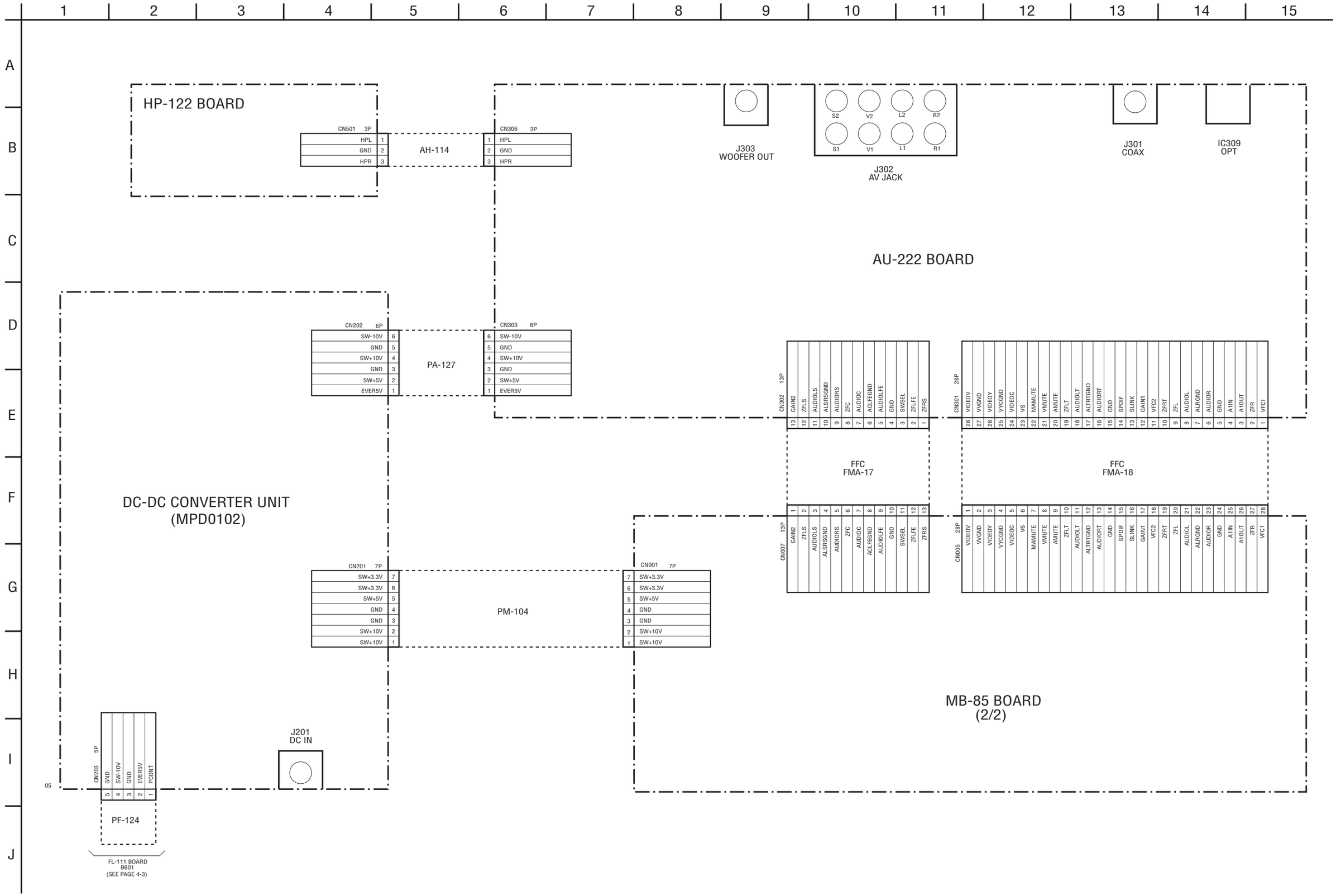
4-1. FRAME SCHEMATIC DIAGRAM

FRAME (1) SCHEMATIC DIAGRAM



FRAME (1/2)

FRAME (2) SCHEMATIC DIAGRAM

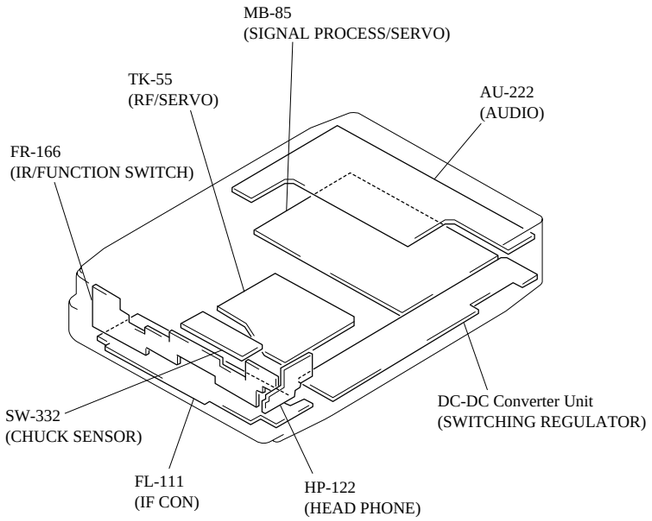


FRAME (2/2)

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

TK-55 (RF/SERVO) PRINTED WIRING BOARD

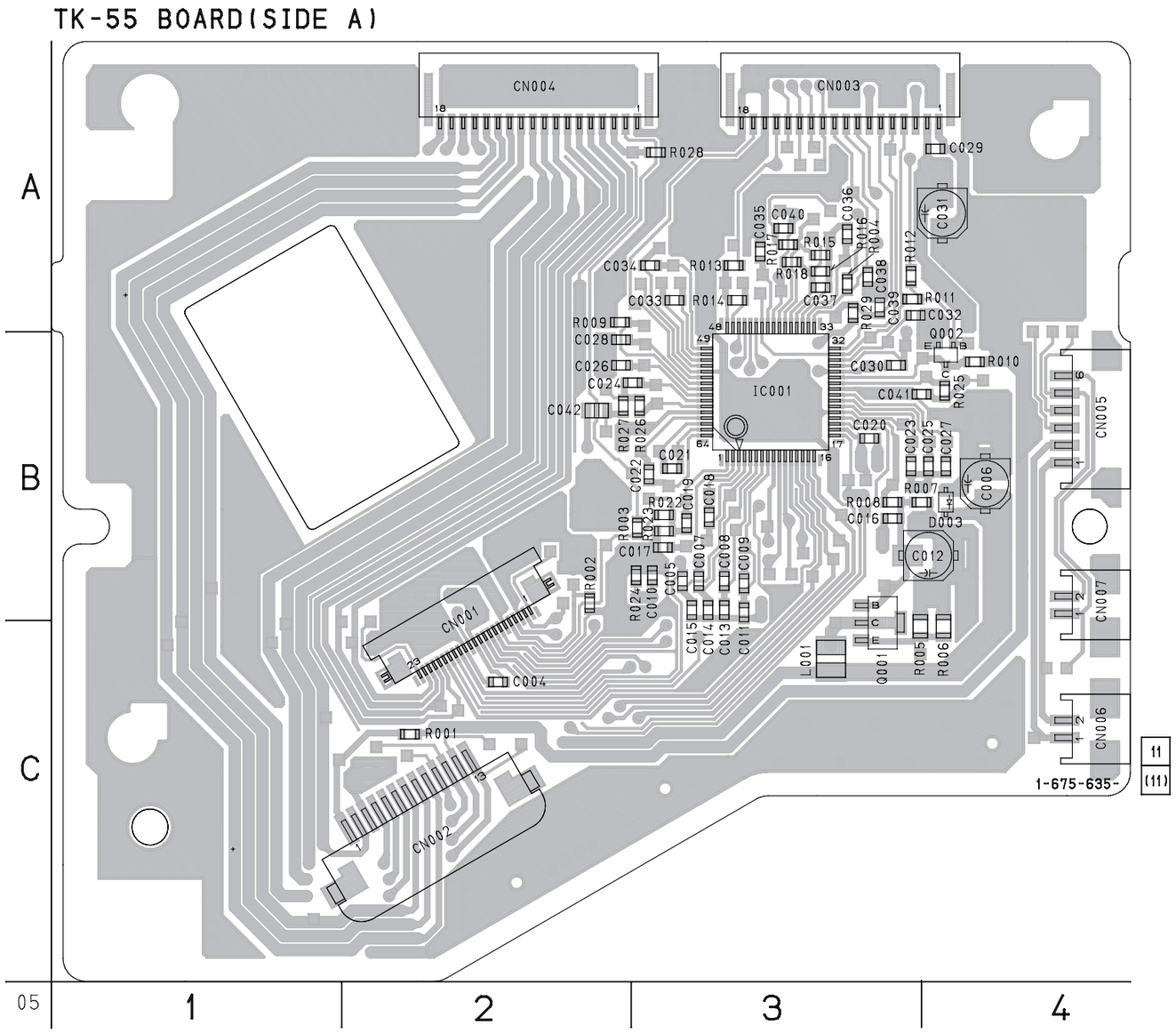
– Ref. No.: TK-55 board; 2,000 series –



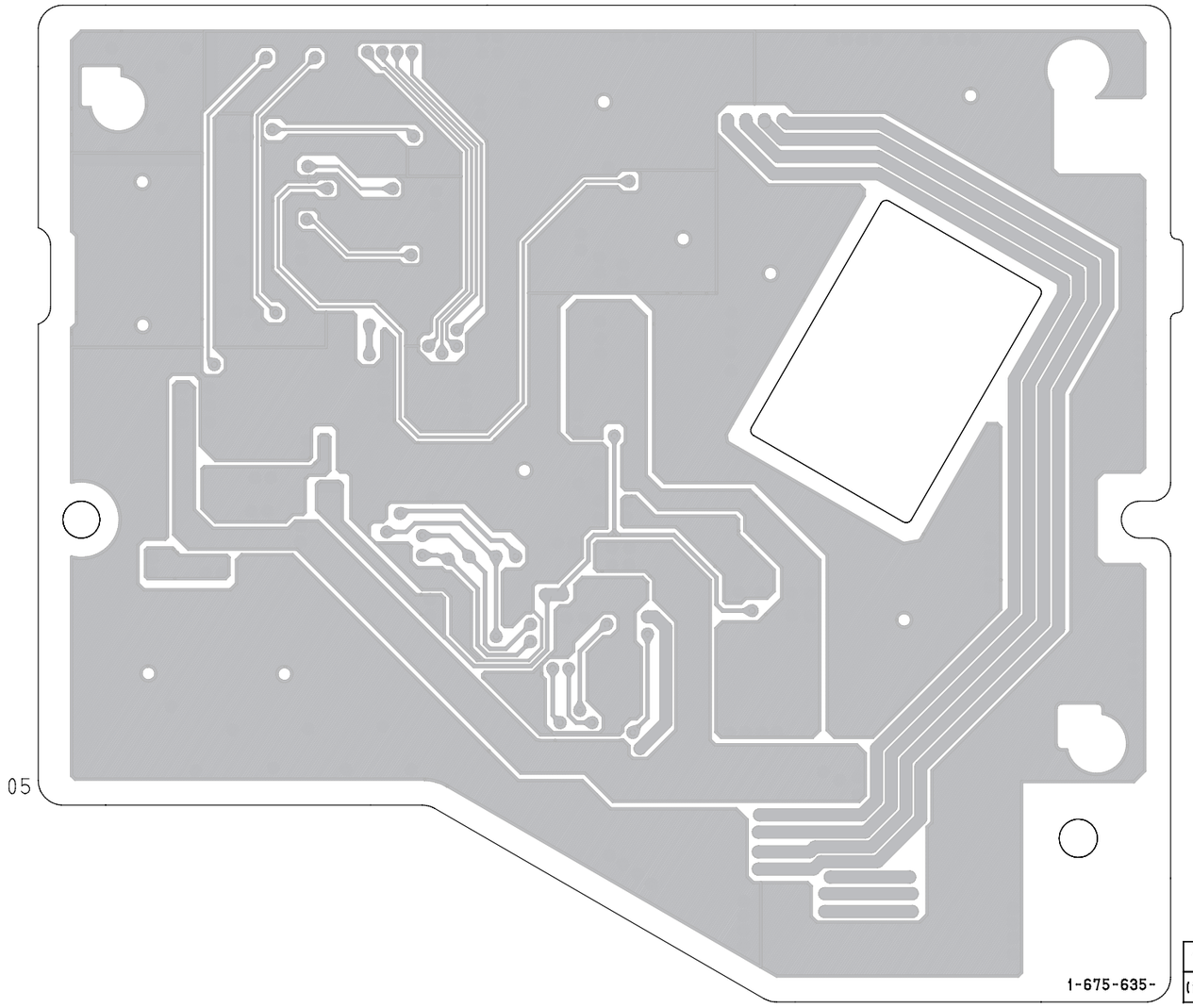
There are few cases that the part isn't mounted in this model is printed on this diagram.

TK-55 BOARD (SIDE A)

CN001	C-2
CN002	C-2
CN003	A-3
CN004	A-2
CN005	B-4
CN006	C-4
CN007	B-4
D003	B-4
IC001	B-3
Q001	C-3
Q002	B-4

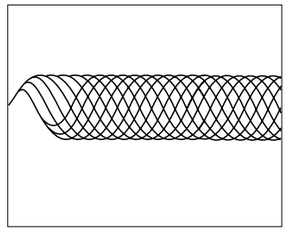


TK-55 BOARD(SIDE B)



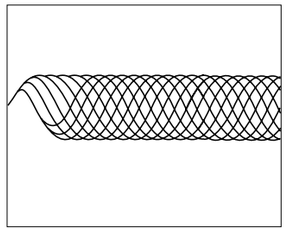
• **Waveforms**

❶ IC001 ① (DVD play)
200 mV/DIV 100 ns/DIV



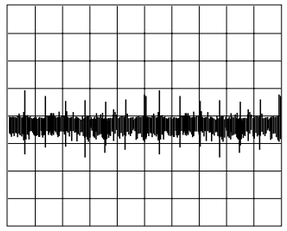
536 mVp-p

❷ IC001 ① (CD play)
500 mV/DIV 500 ns/DIV



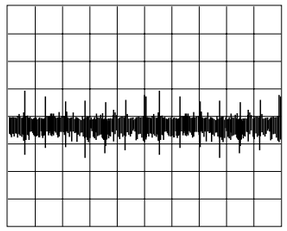
880 mVp-p

❸ IC001 ㉙ (DVD play)
200 mV/DIV 500 ms/DIV



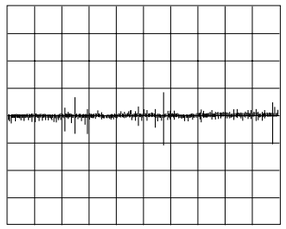
592 mVp-p

❹ IC001 ㉙ (CD play)
200 mV/DIV 20 ms/DIV



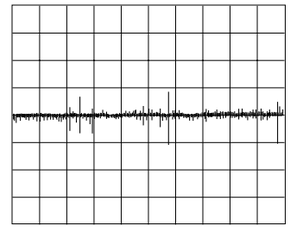
448 mVp-p

❺ IC001 ㊴ (DVD play)
500 mV/DIV 50 ms/DIV



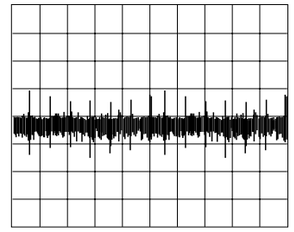
1.3 Vp-p

❻ IC001 ㊴ (CD play)
500 mV/DIV 200 ms/DIV



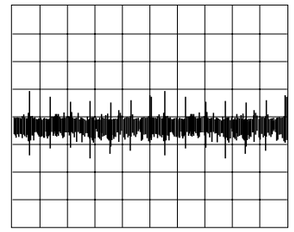
1.7 Vp-p

❼ IC001 ㊵ (DVD play)
100 mV/DIV 50 ms/DIV



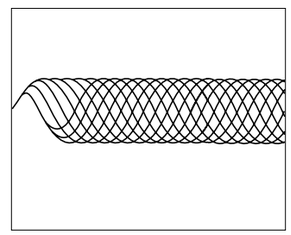
180 mVp-p

❽ IC001 ㊵ (CD play)
500 mV/DIV 50 ms/DIV



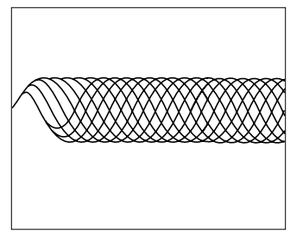
860 mVp-p

❾ IC001 ㊹ (DVD play)
500 mV/DIV 100 ns/DIV



1.5 Vp-p

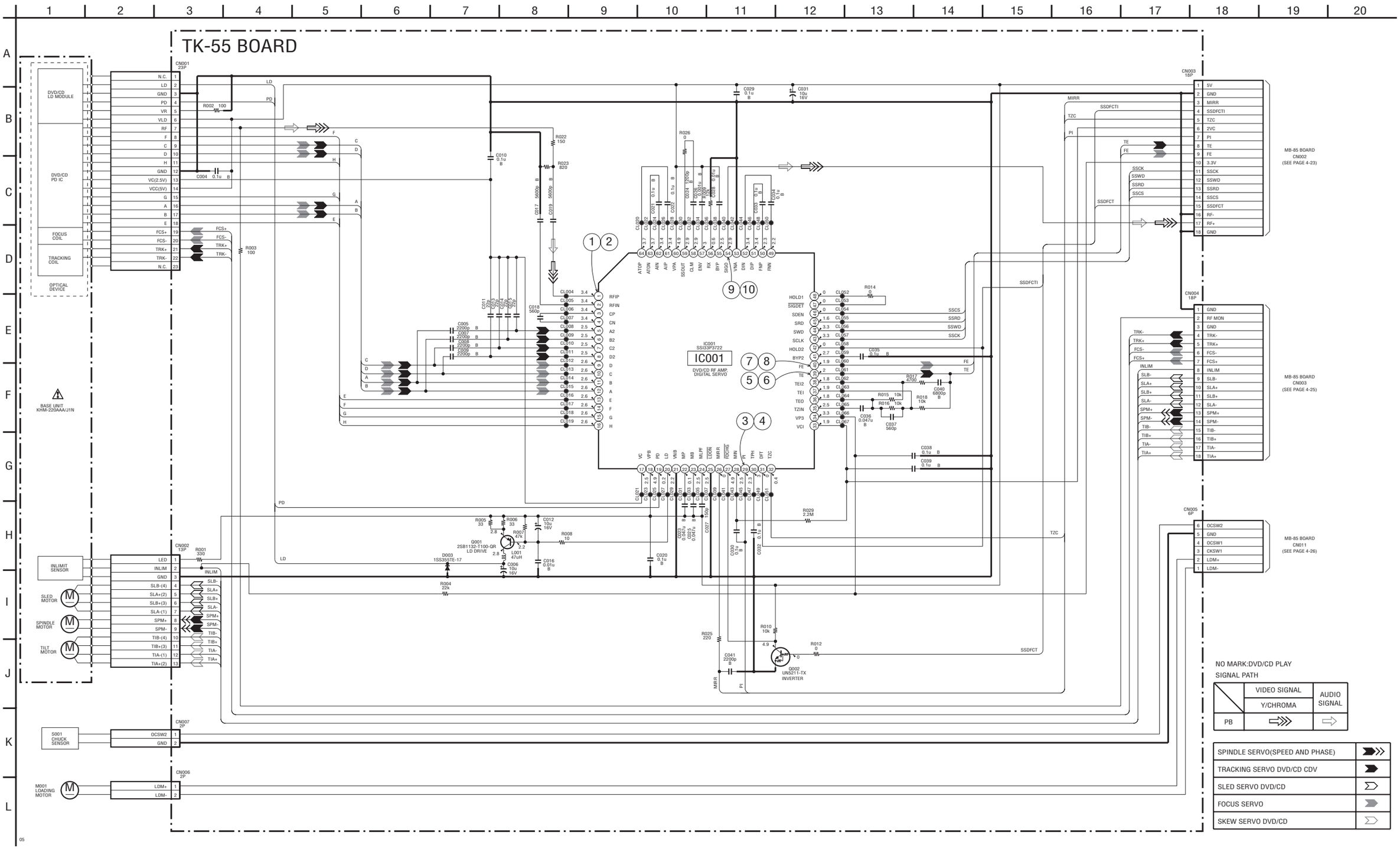
❿ IC001 ㊹ (CD play)
500 mV/DIV 500 ns/DIV



1.5 Vp-p

TK-55 (RF/SERVO) SCHEMATIC DIAGRAM • See page 4-7 for printed wiring board and page 4-10 for waveforms.

– Ref. No.: TK-55 board; 2,000 series –

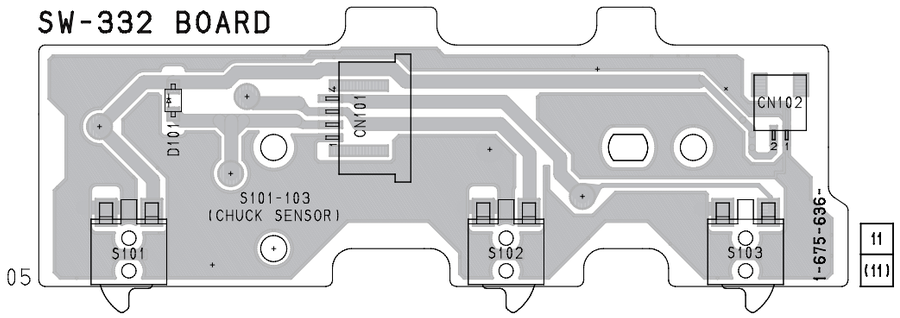


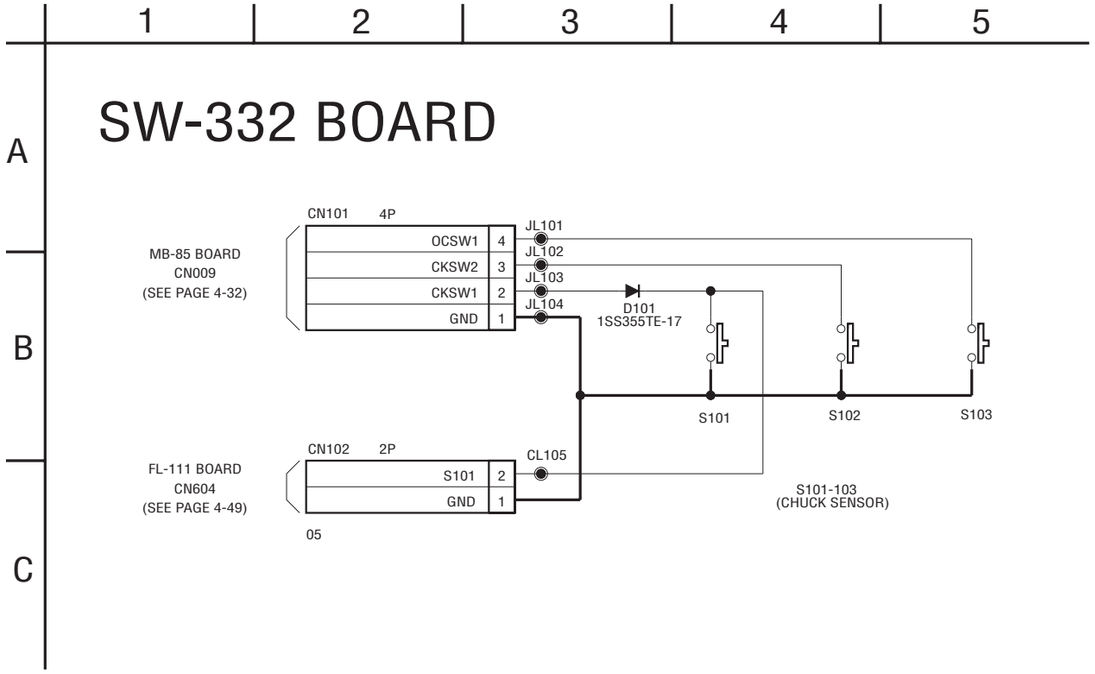
Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

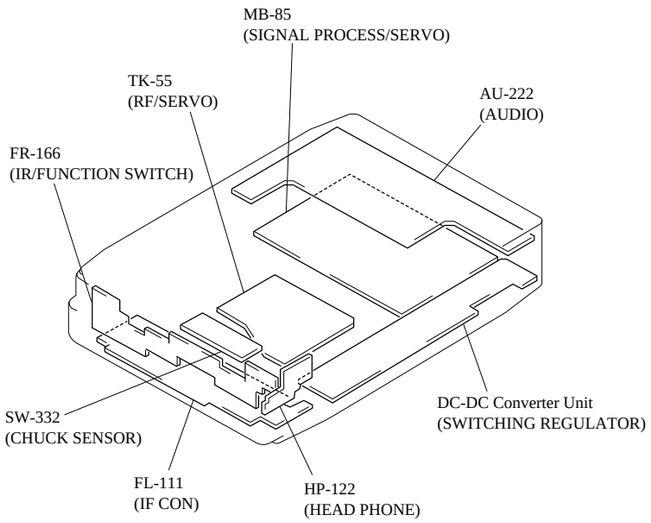
SW-332 (CHUCK SENSOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: SW-332 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.







MB-85 (SIGNAL PROCESS/SERVO) PRINTED WIRING BOARD

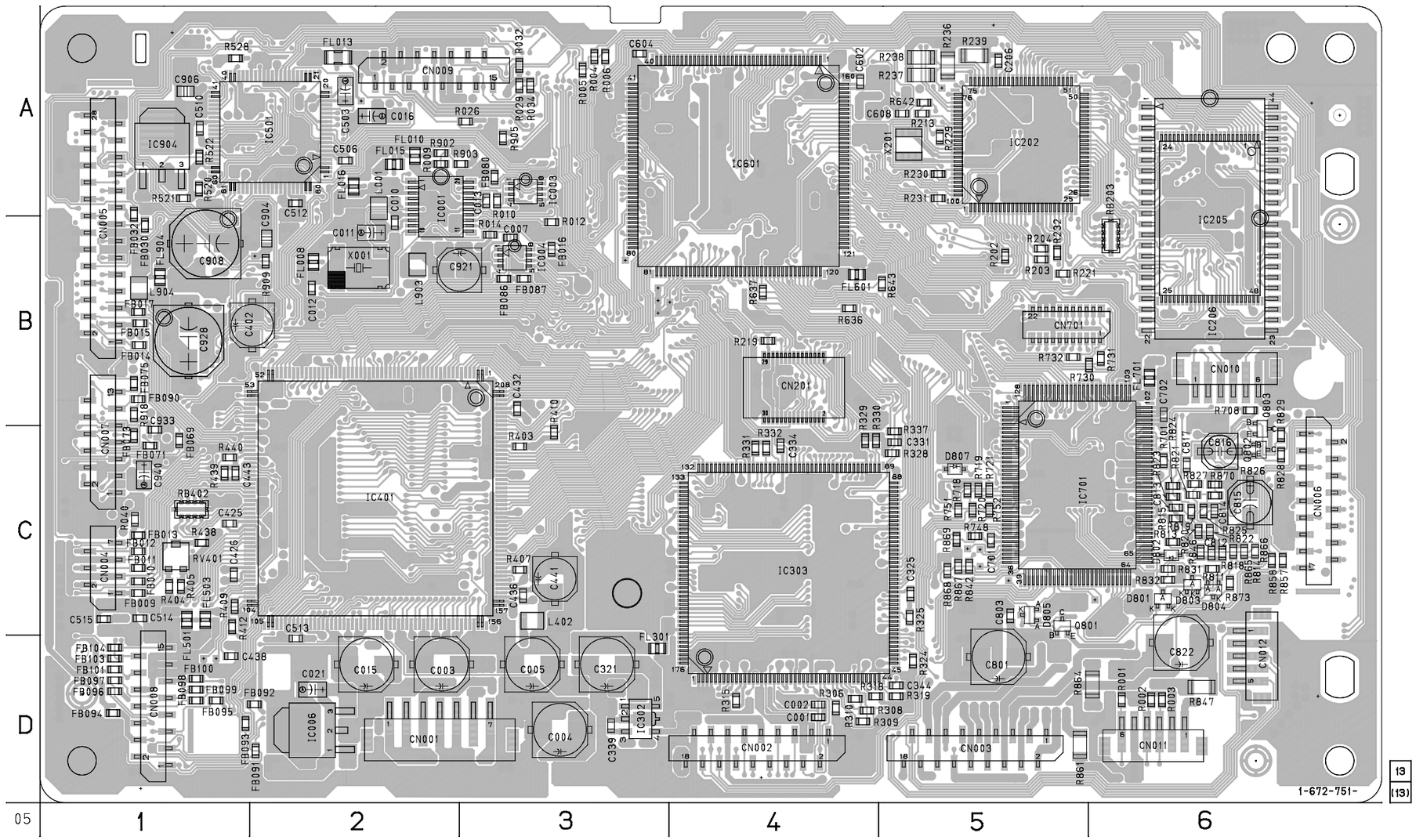
– Ref. No.: MB-85 board; 1,000 series –

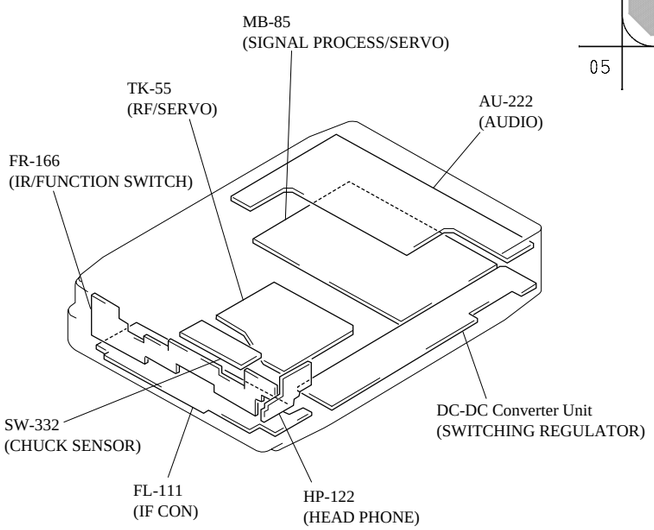
There are few cases that the part isn't mounted in this model is printed on this diagram.

MB-85 BOARD (SIDE A)

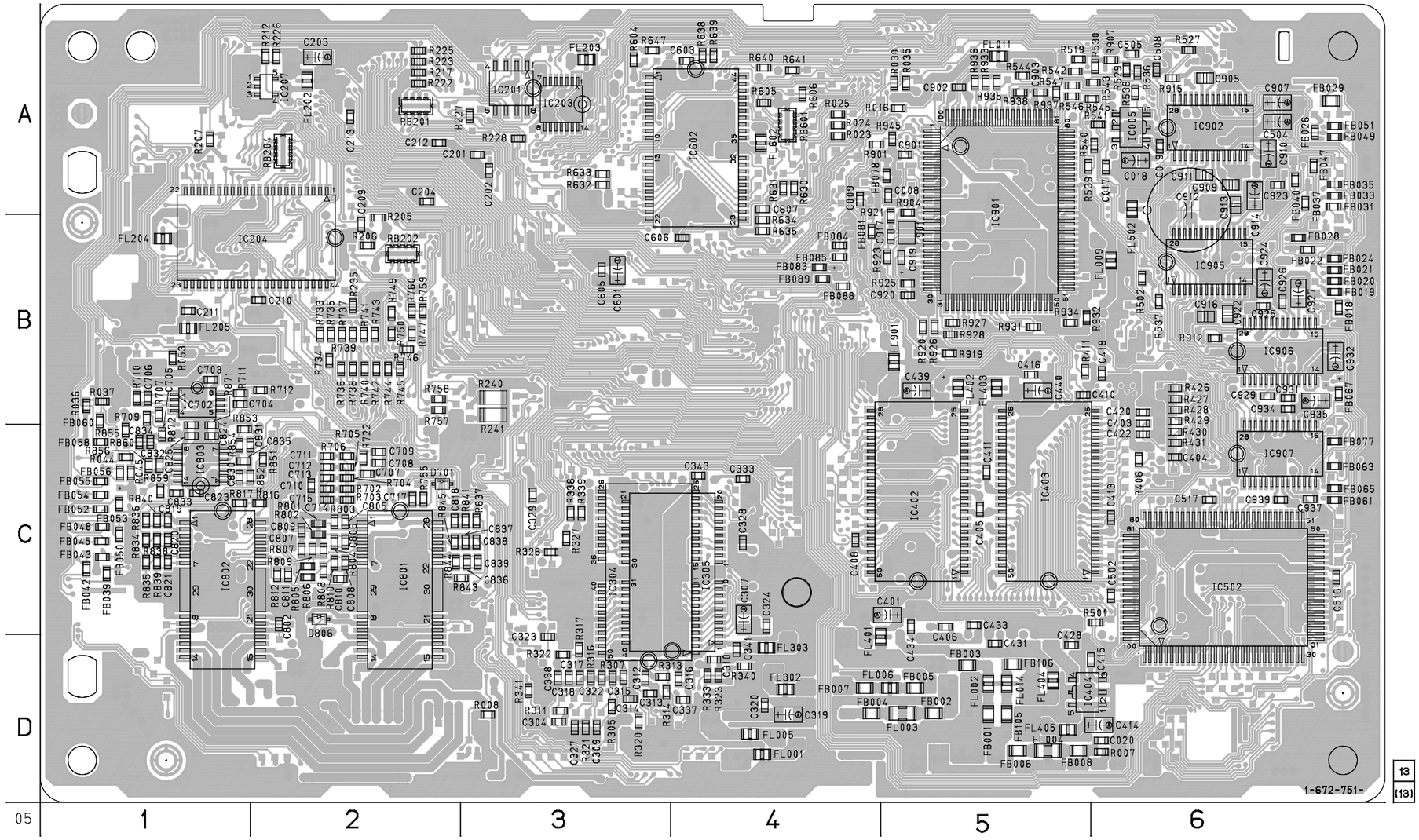
CN001	D-2
CN002	D-4
CN003	D-5
CN005	B-1
CN006	C-7
CN007	C-1
CN009	A-2
CN010	B-6
CN011	D-6
CN012	D-6
D801	C-6
D802	C-6
D803	C-6
D804	C-6
D805	C-5
D807	C-5
IC001	A-2
IC003	A-3
IC004	B-3
IC202	A-5
IC205	B-6
IC206	B-6
IC302	D-3
IC303	C-4
IC401	C-2
IC501	A-2
IC601	A-4
IC701	C-5
IC904	A-1
Q801	C-5
Q802	C-6
Q803	C-6

MB-85 BOARD(SIDE A)





MB-85 BOARD(SIDE B)

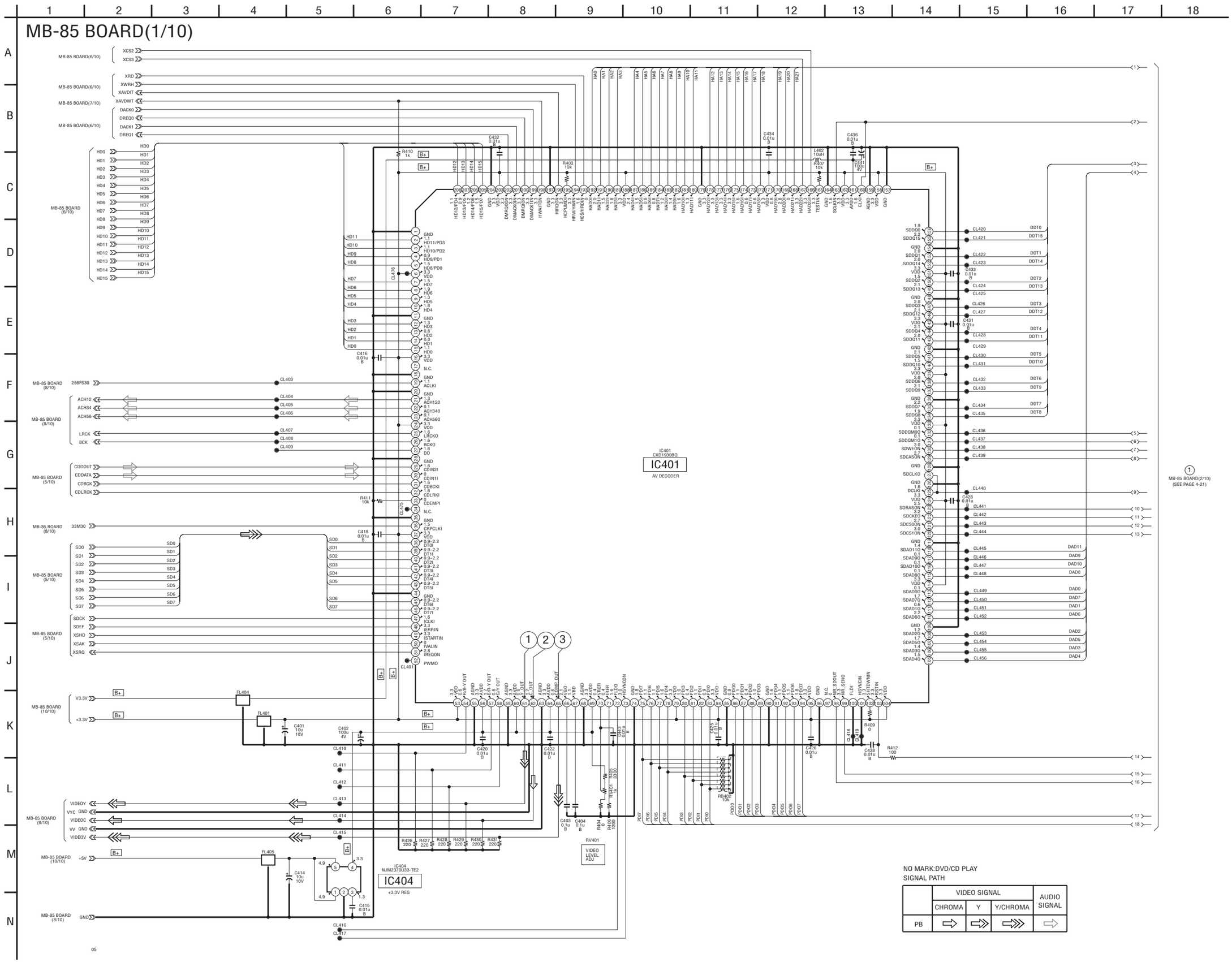


MB-85 BOARD (SIDE B)

D701	C-2
D806	C-2
IC005	A-6
IC201	A-3
IC203	A-3
IC204	B-2
IC207	A-2
IC304	C-3
IC402	C-5
IC403	C-5
IC404	D-5
IC702	B-1
IC801	C-2
IC802	C-1
IC803	C-1
IC902	A-6
IC907	C-6

MB-85 (AV DECODER) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –

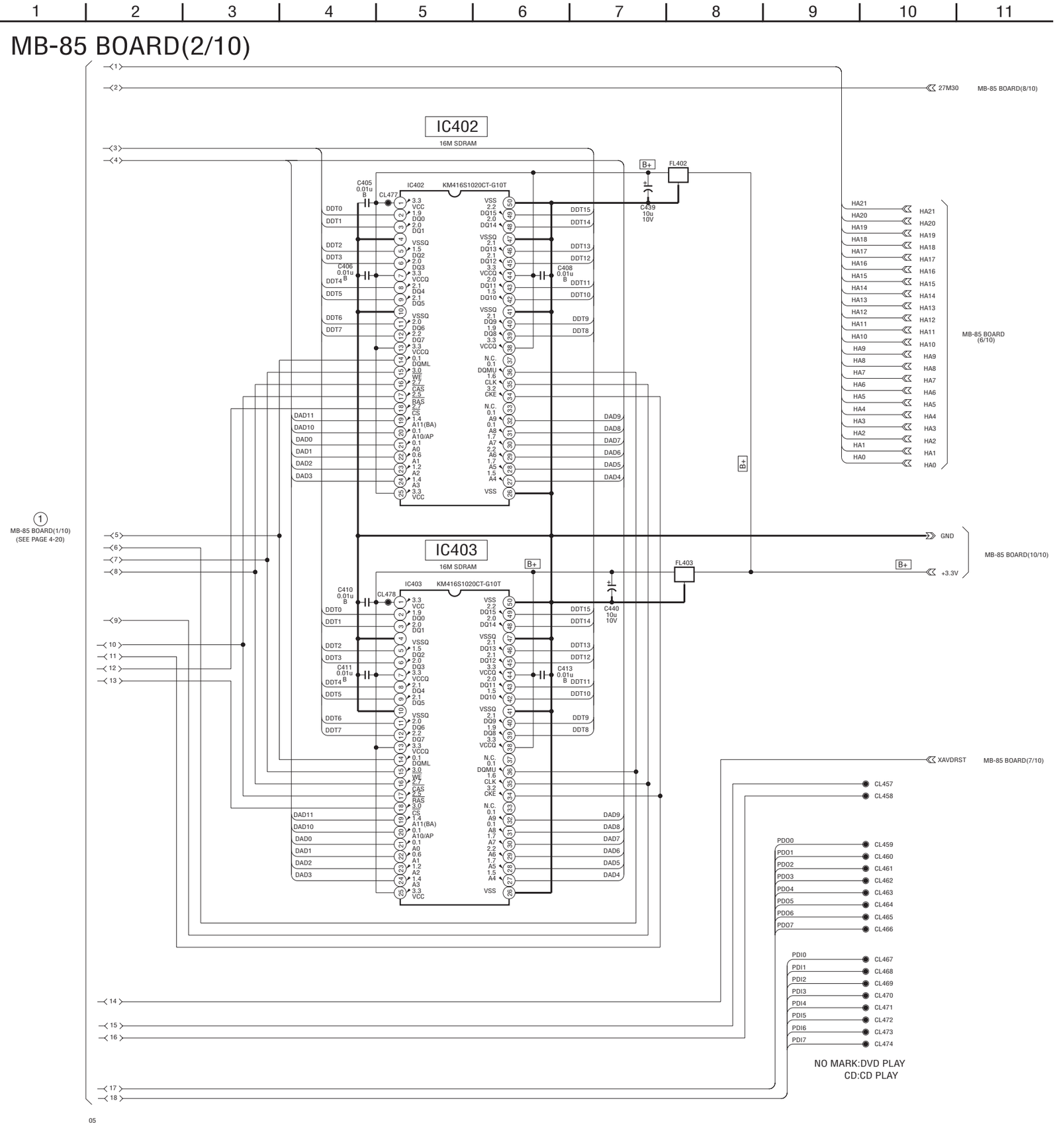


AV DECODER
MB-85 (1/10)

MB-85 (SDRAM) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

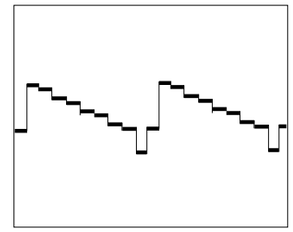
– Ref. No.: MB-85 board; 1,000 series –

MB-85 BOARD(2/10)



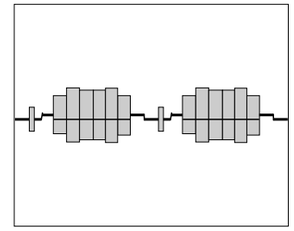
• Waveforms

❶ IC401 61



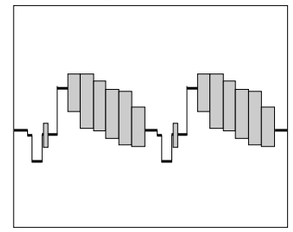
1.1 Vp-p (H)

❷ IC401 62



816 mVp-p (H)

❸ IC401 65



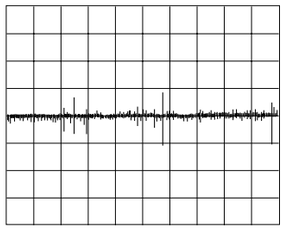
1.2 Vp-p (H)

MB-85 (SERVO DSP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –

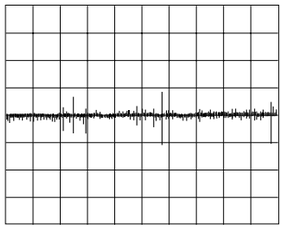
• Waveforms

❶ IC701 ㊾ (DVD play)
500 mV/DIV 50 ms/DIV



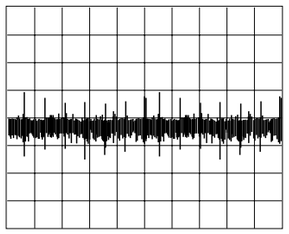
1.4 Vp-p

❷ IC701 ㊾ (CD play)
500 mV/DIV 200 mV/DIV



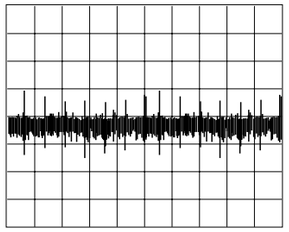
1.7 Vp-p

❸ IC701 ㊽ (DVD play)
100 mV/DIV 5 ms/DIV

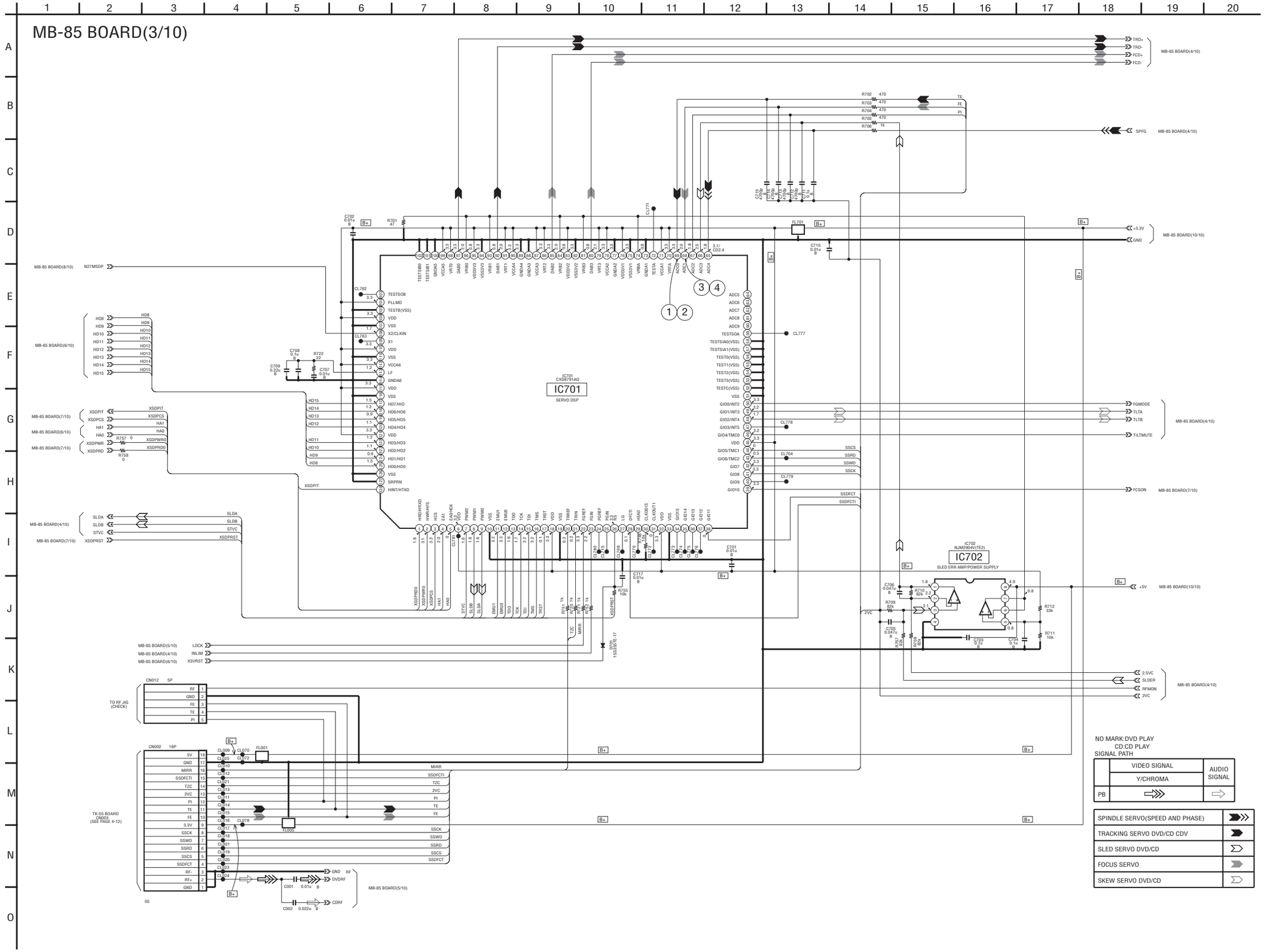


180 mVp-p

❹ IC701 ㊽ (CD play)
500 mV/DIV 50 ms/DIV

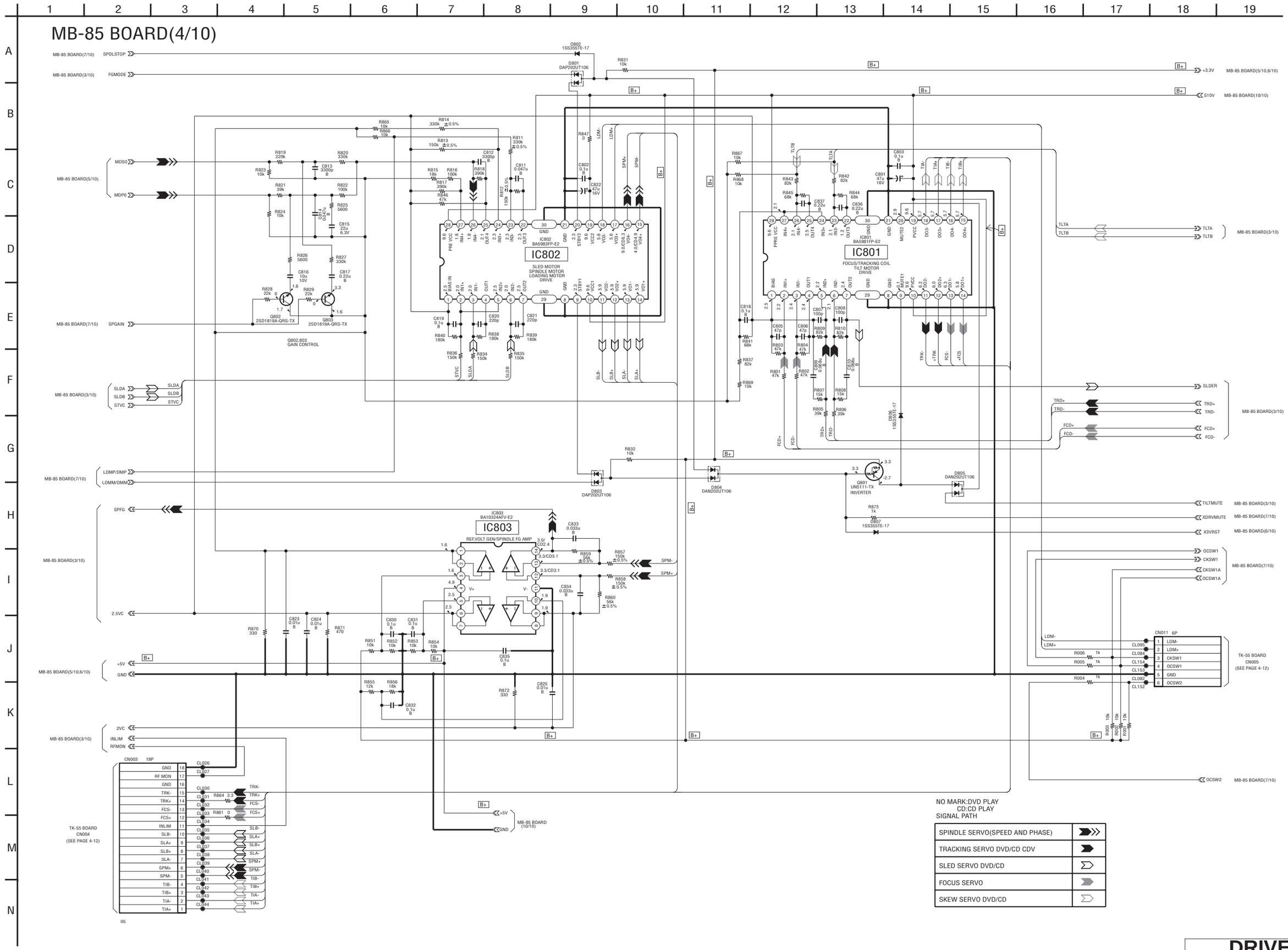


860 mVp-p



MB-85 (DRIVE) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

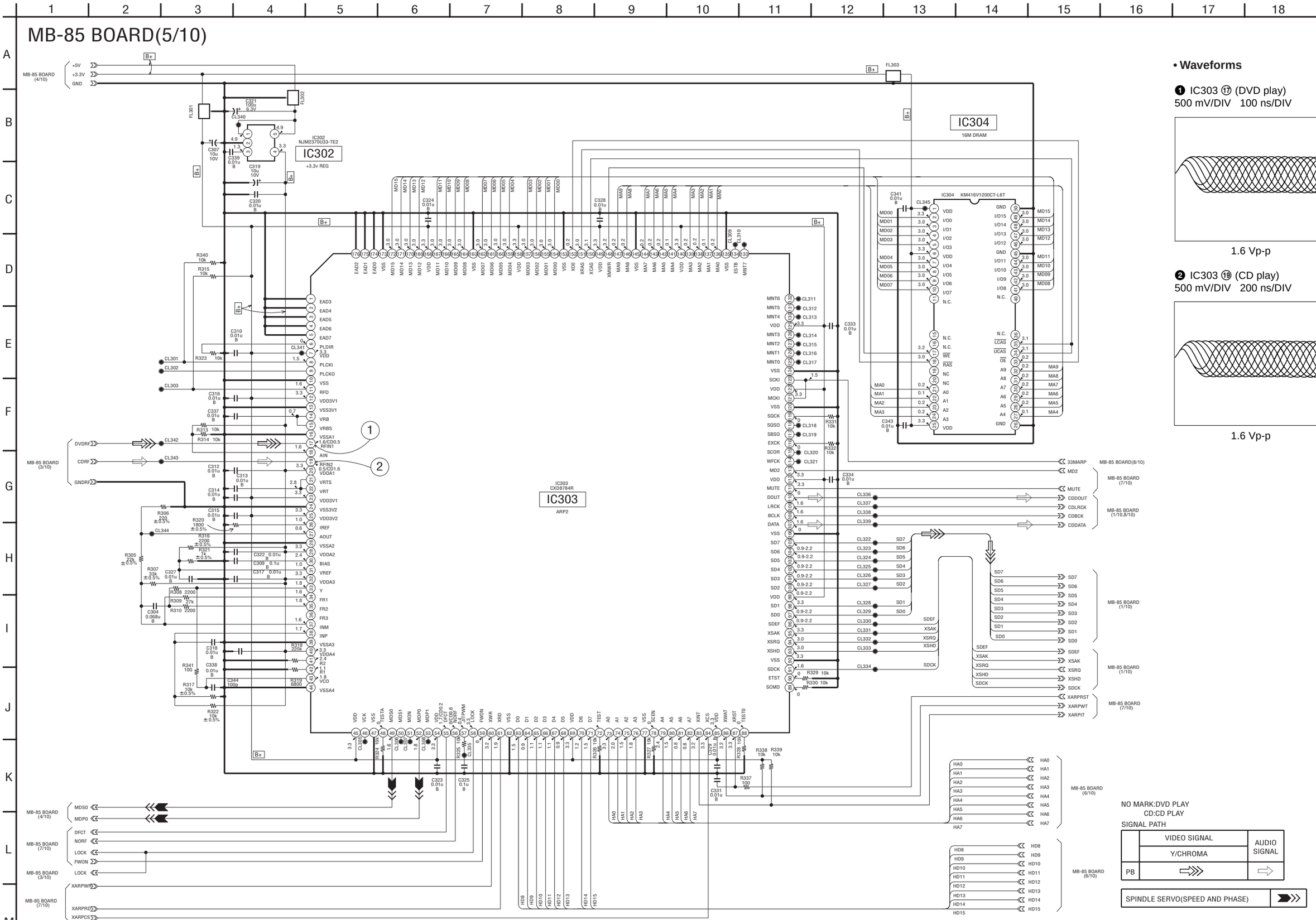
– Ref. No.: MB-85 board; 1,000 series –



MB-85 (ARP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

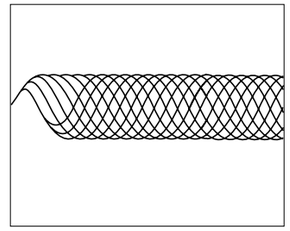
– Ref. No.: MB-85 board; 1,000 series –

MB-85 BOARD(5/10)



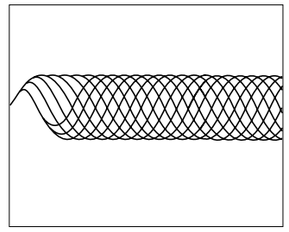
• Waveforms

❶ IC303 ⑰ (DVD play)
500 mV/DIV 100 ns/DIV



1.6 Vp-p

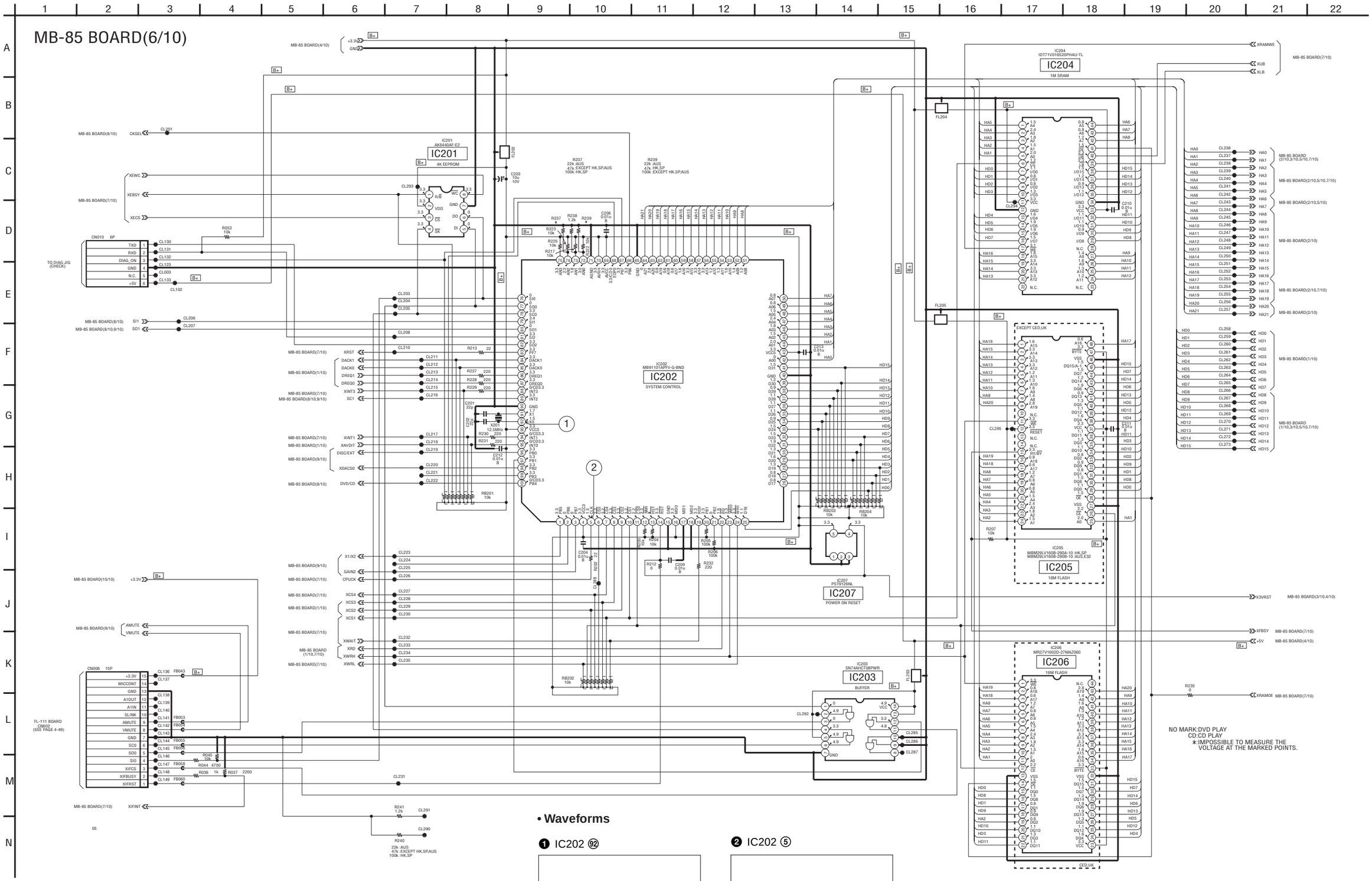
❷ IC303 ⑲ (CD play)
500 mV/DIV 200 ns/DIV



1.6 Vp-p

MB-85 (SYSTEM CONTROL) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

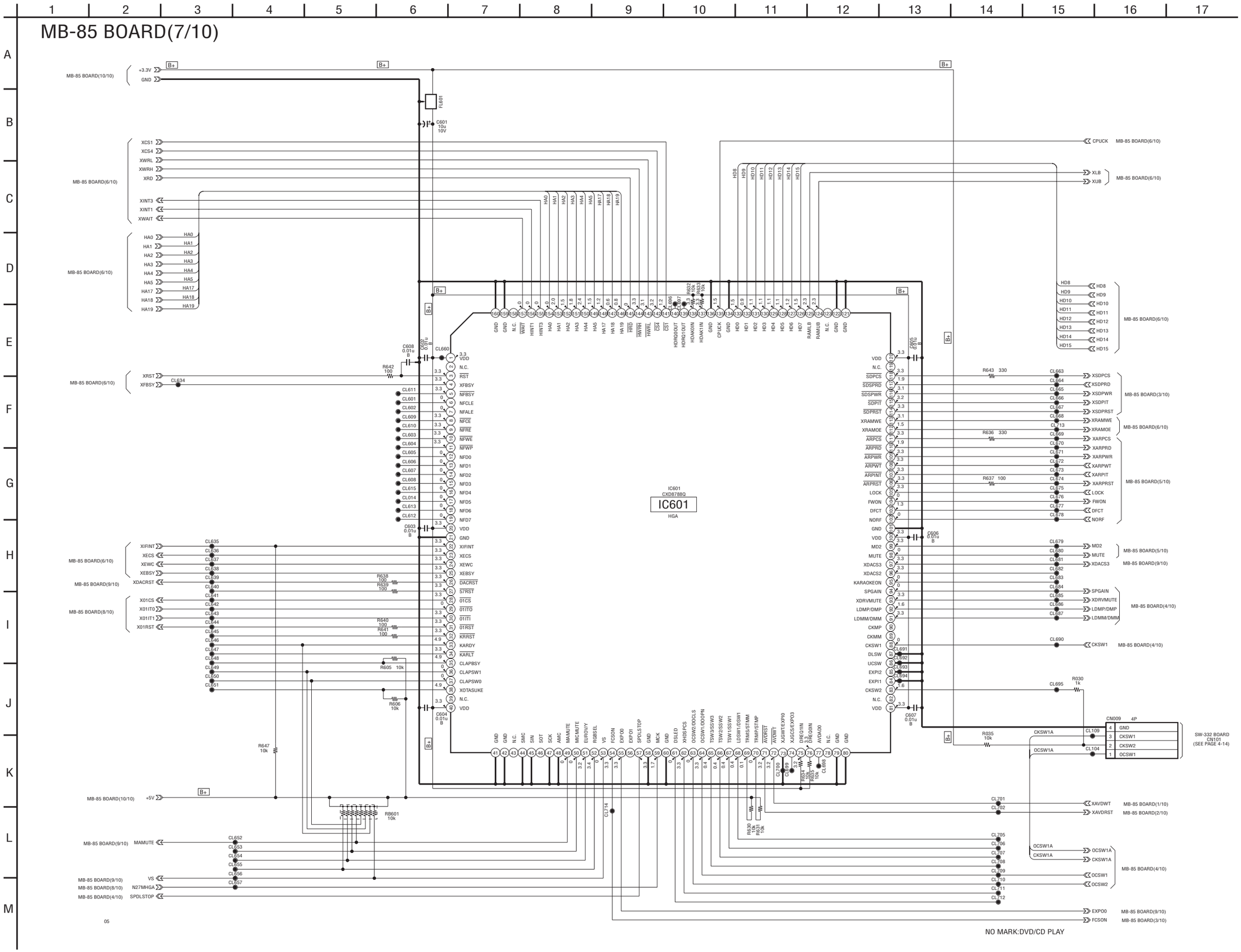
– Ref. No.: MB-85 board; 1,000 series –



SYSTEM CONTROL
MB-85 (6/10)

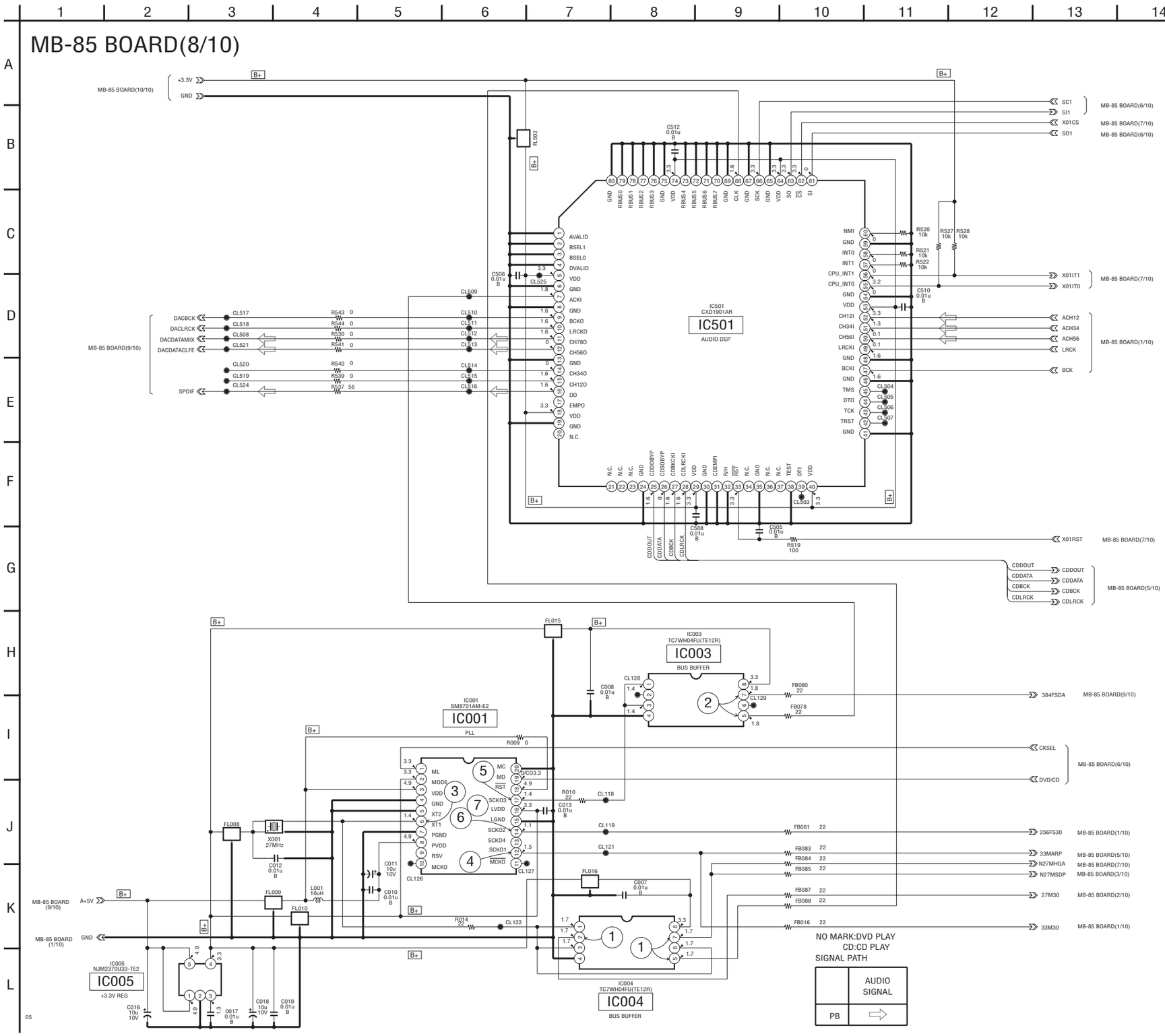
MB-85 (HGA) SCHEMATIC DIAGRAM • **See page 4-15 for printed wiring board.**

– Ref. No.: MB-85 board; 1,000 series –



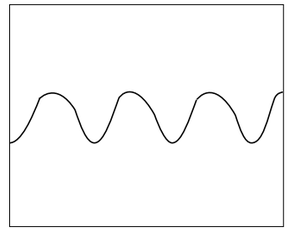
MB-85 (CLOCK GENERATOR/AUDIO DSP) SCHEMATIC DIAGRAM • See page 4-15 for printed wiring board.

– Ref. No.: MB-85 board; 1,000 series –



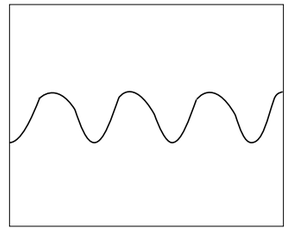
• Waveforms

❶ IC004 ②, ⑤, ⑦



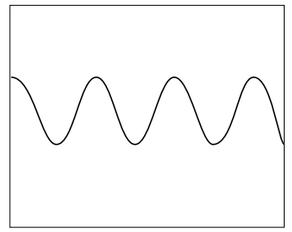
4.2 Vp-p (26.9 MHz)

❷ IC004 ⑤, ⑦



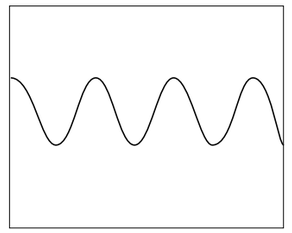
DVD: 6.2 Vp-p (37.0 MHz)
CD : 5 Vp-p (33.6 MHz)

❸ IC001 ⑥



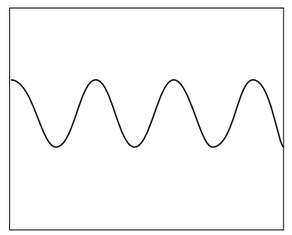
4.2 Vp-p (27.0 MHz)

❹ IC001 ⑫



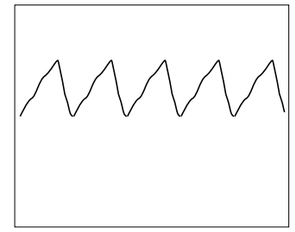
4.6 Vp-p (33.8 MHz)

❺ IC001 ⑰



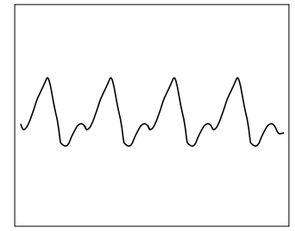
DVD: 5.8 Vp-p (36.5 MHz)
CD : 5.1 Vp-p (33.8 MHz)

❻ IC001 ⑭ (DVD play)



4.2 Vp-p (25.3 MHz)

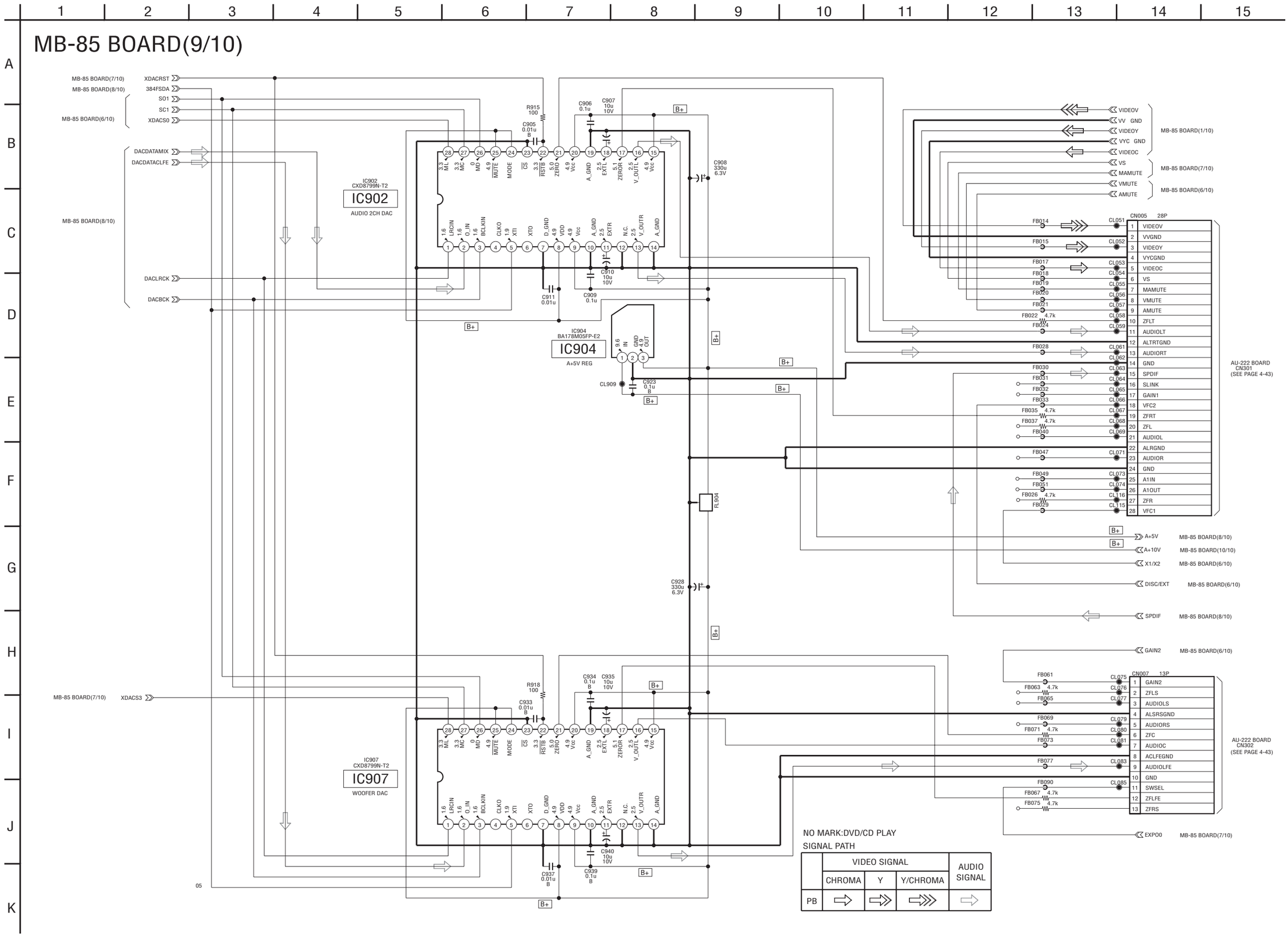
❼ IC001 ⑭ (CD play)



4.7 Vp-p (22.5 MHz)

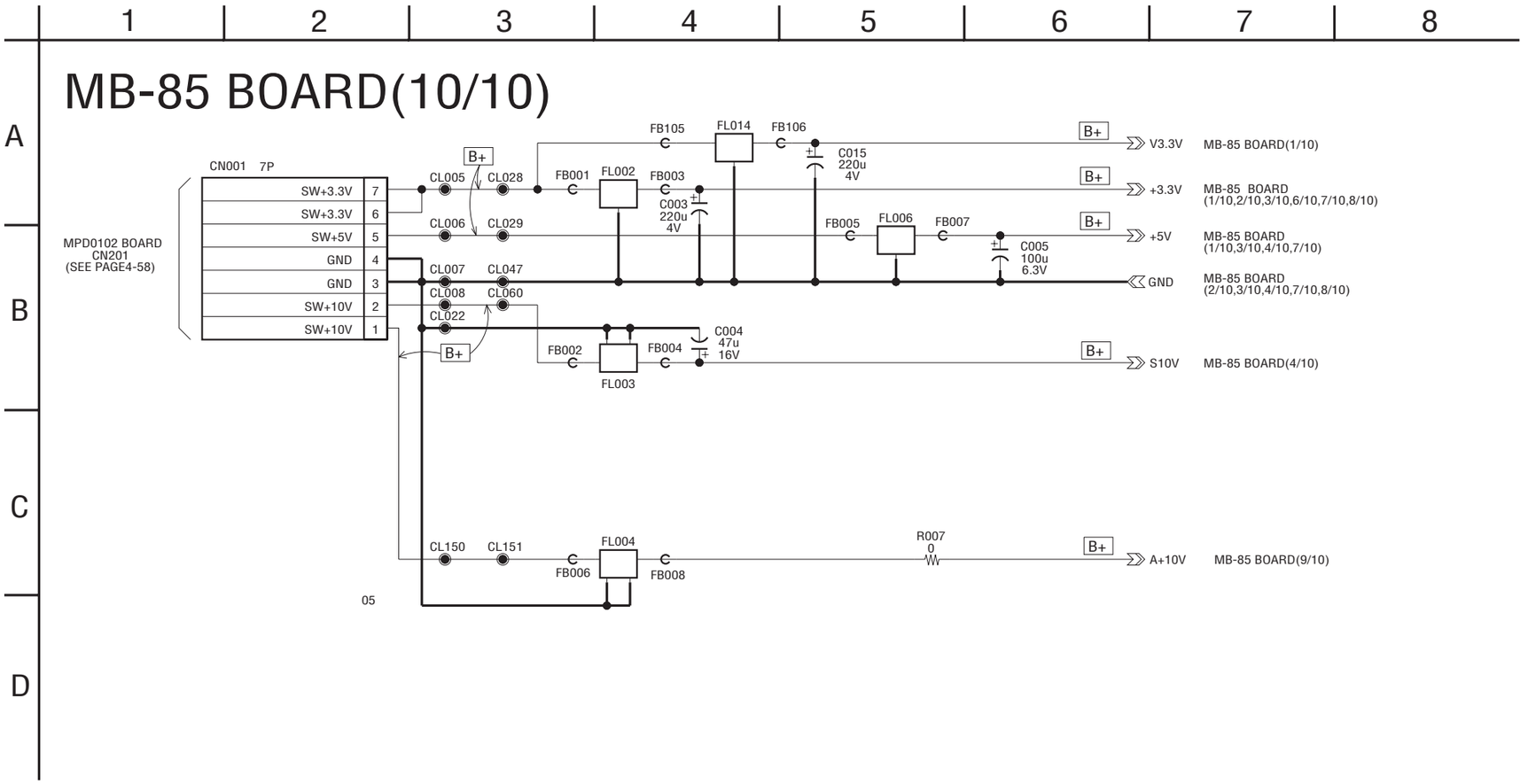
MB-85 (DAC) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-85 board; 1,000 series –



MB-85 (BIAS) SCHEMATIC DIAGRAM **• See page 4-15 for printed wiring board.**

– Ref. No.: MB-85 board; 1,000 series –



AU-222 (AUDIO/VIDEO BUFFER) PRINTED WIRING BOARD

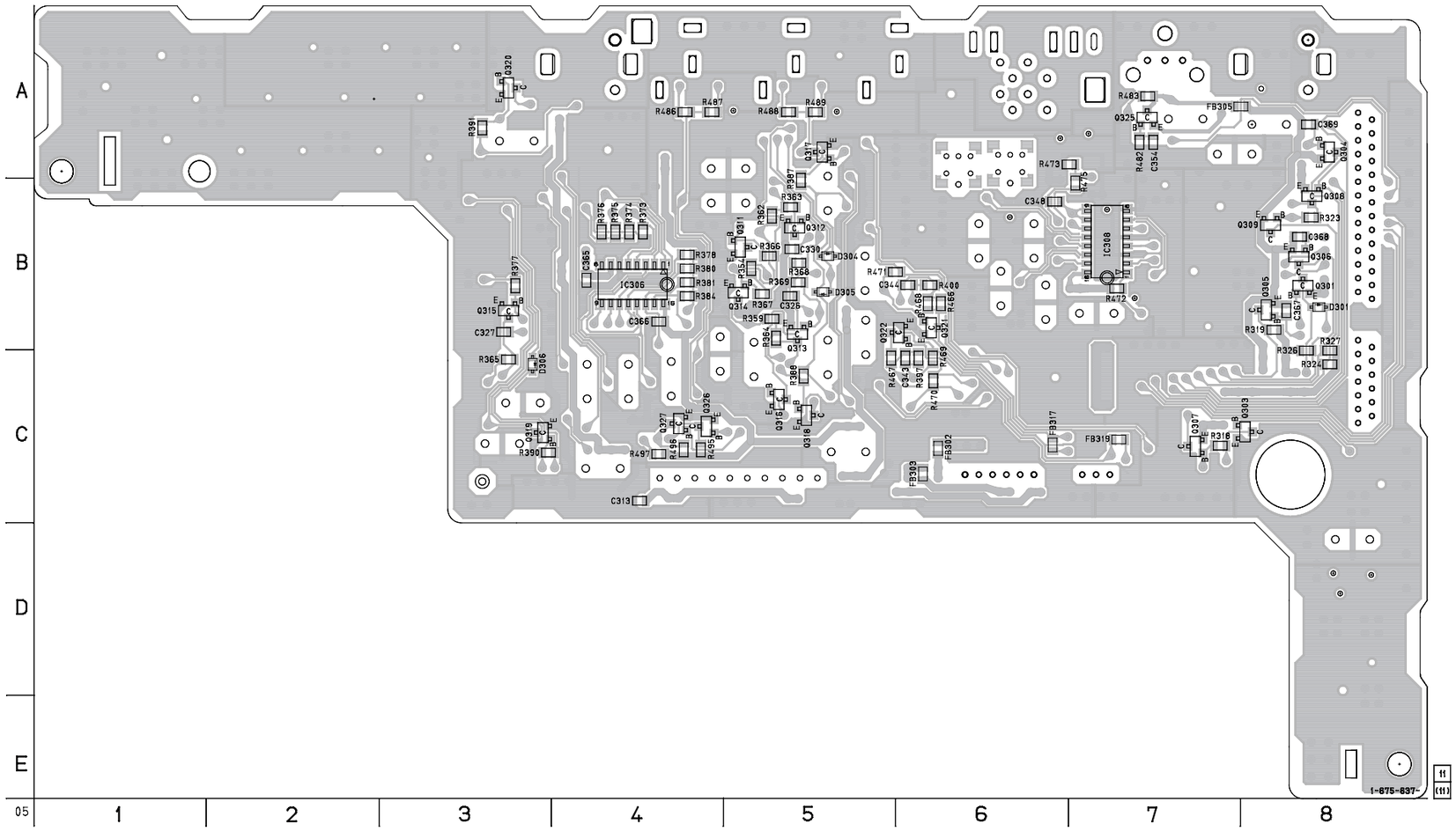
– Ref. No.: AU-222 board; 2,000 series –

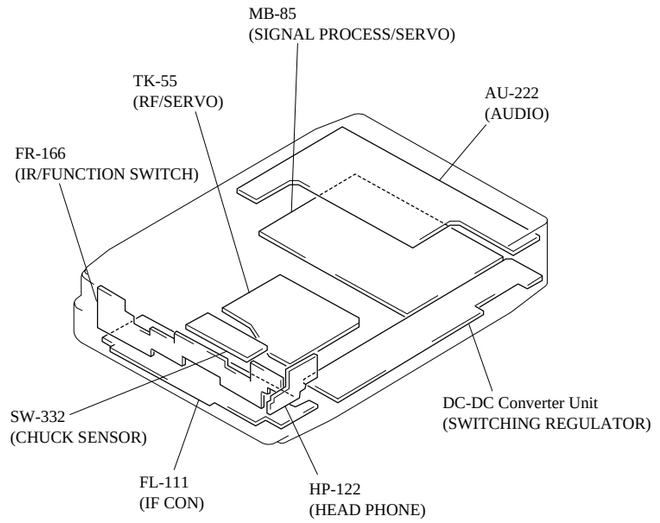
There are few cases that the part isn't mounted in this model is printed on this diagram.

AU-222 BOARD (SIDE A)

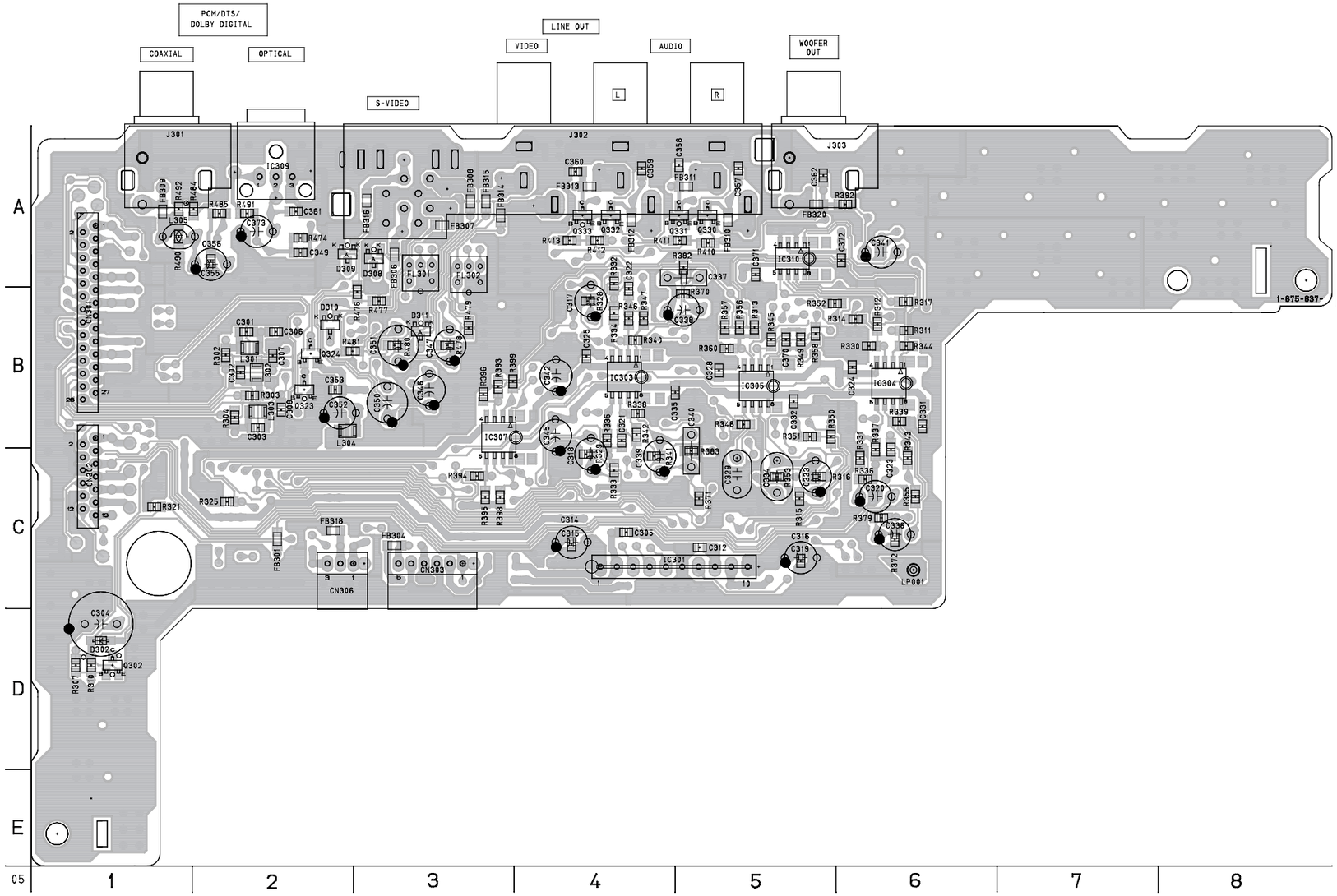
D301	B-8
D304	B-5
D305	B-5
D306	C-3
IC306	B-4
IC308	B-7
Q301	B-8
Q303	C-8
Q304	A-8
Q305	B-8
Q306	B-8
Q307	C-7
Q311	B-5
Q314	B-5
Q317	A-5
Q318	C-5
Q319	C-3
Q320	A-3
Q321	B-6
Q322	B-5
Q325	A-7
Q326	C-4
Q327	C-4

AU-222 BOARD(SIDE A)





AU-222 BOARD(SIDE B)



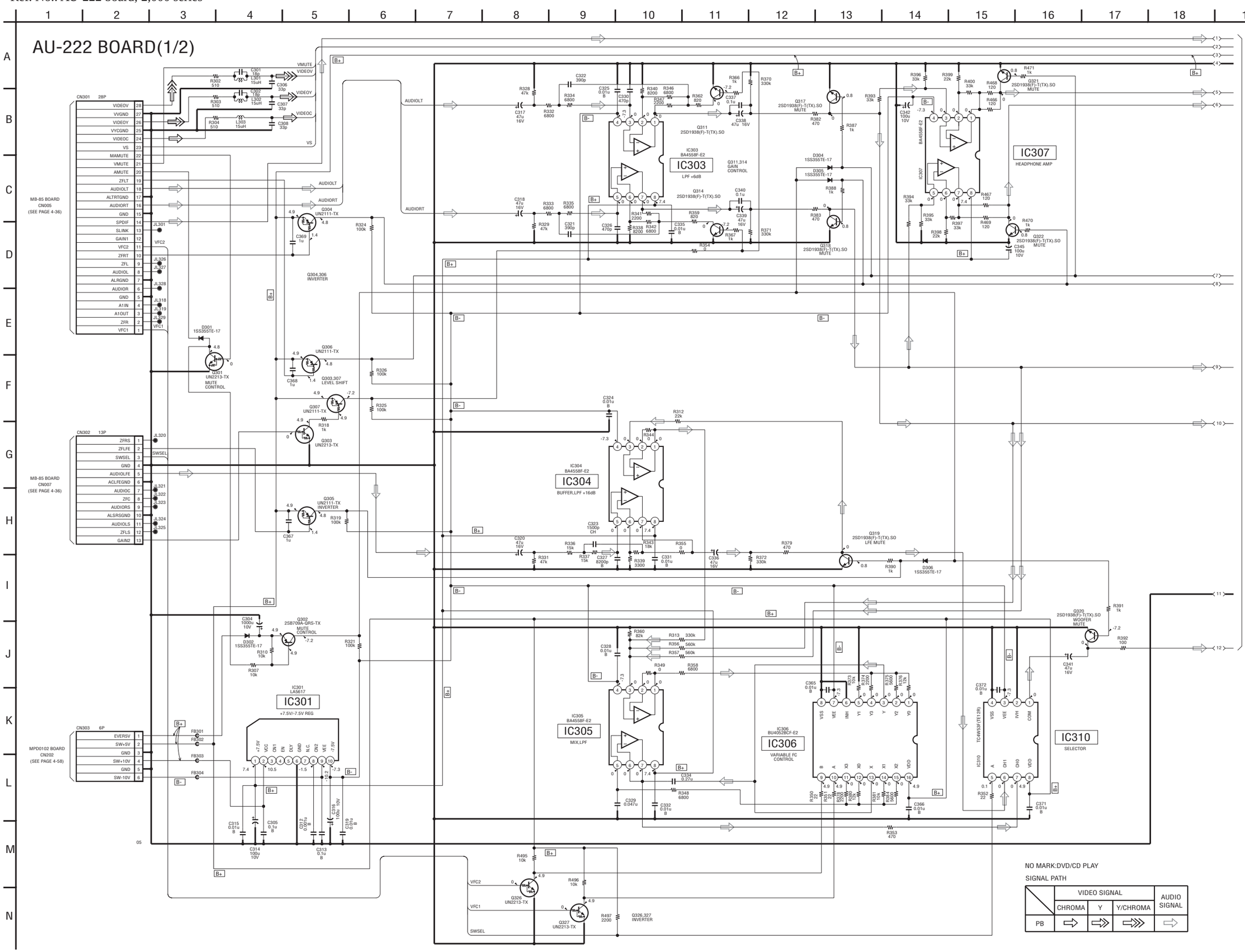
AU-222 BOARD (SIDE B)

CN301	B-1
CN302	C-1
CN303	C-3
CN306	C-2
D302	D-1
D308	A-3
D309	A-2
D310	B-2
D311	B-3
IC301	C-4
IC303	B-4
IC304	B-6
IC305	B-5
IC307	B-3
IC309	A-2
IC310	A-5
Q302	D-1
Q323	B-2
Q324	B-2
Q330	A-5
Q331	A-5
Q332	A-4
Q333	A-4

AU-222 (AUDIO) SCHEMATIC DIAGRAM **• See page 4-39 for printed wiring board.**

– Ref. No.: AU-222 board; 2,000 series –

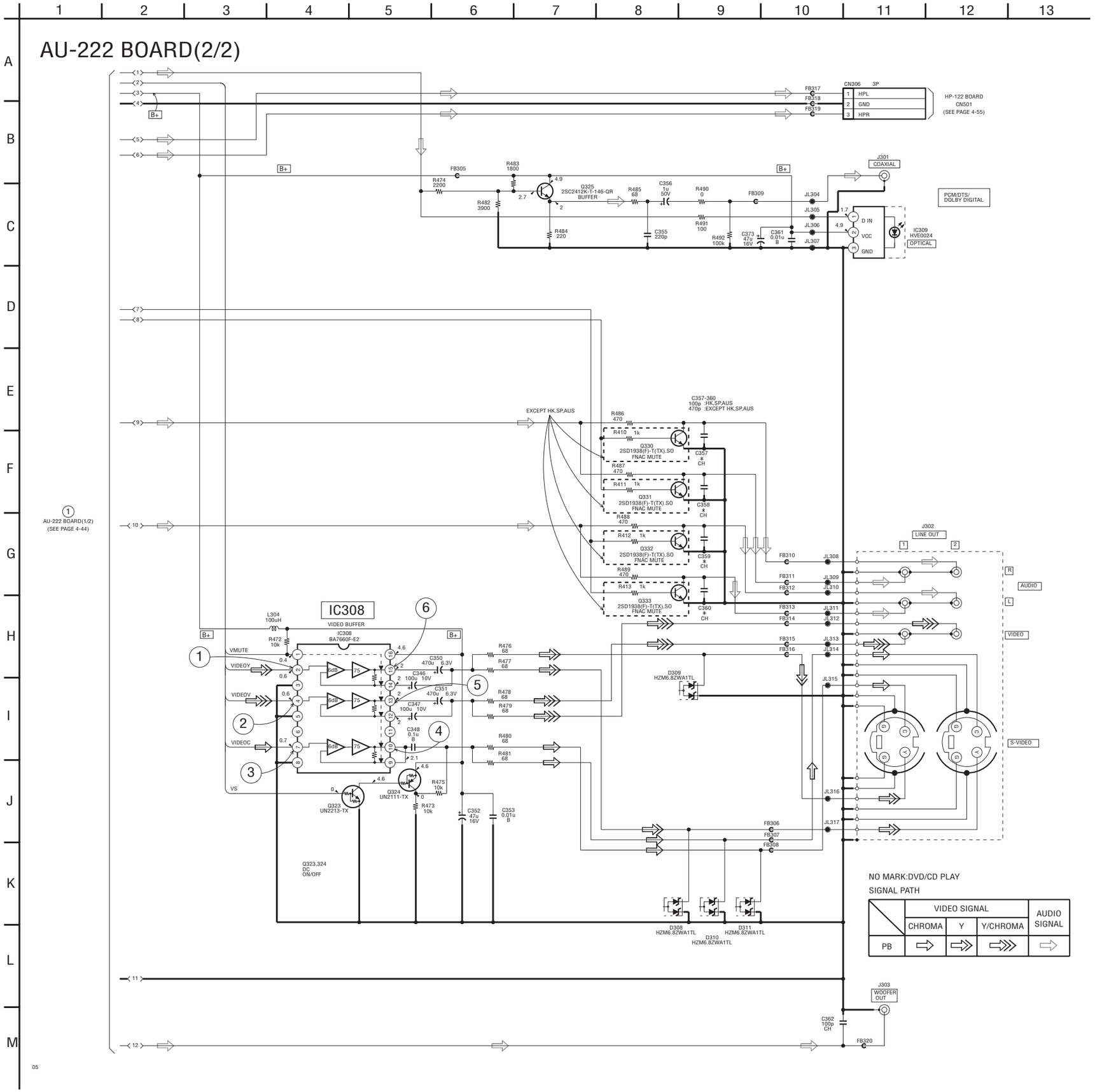
AU-222 BOARD(1/2)



AUDIO
AU-222 (1/2)

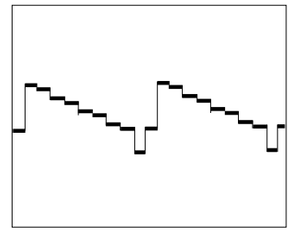
AU-222 (VIDEO BUFFER) SCHEMATIC DIAGRAM **• See page 4-39 for printed wiring board.**

– Ref. No.: AU-222 board; 2,000 series –



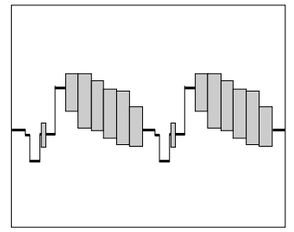
• **Waveforms**

❶ IC308 ②



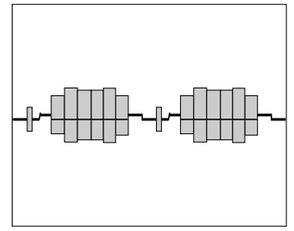
1.1 Vp-p (H)

❷ IC308 ④



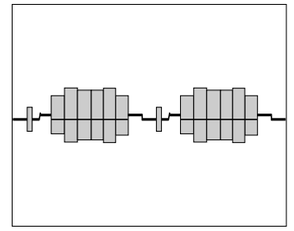
1.2 Vp-p (H)

❸ IC308 ⑦



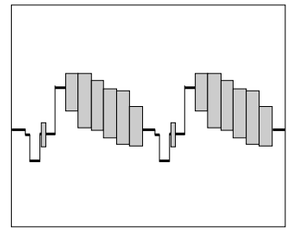
860 mVp-p (H)

❹ IC308 ⑩



1.8 Vp-p(H)

❺ IC308 ⑬



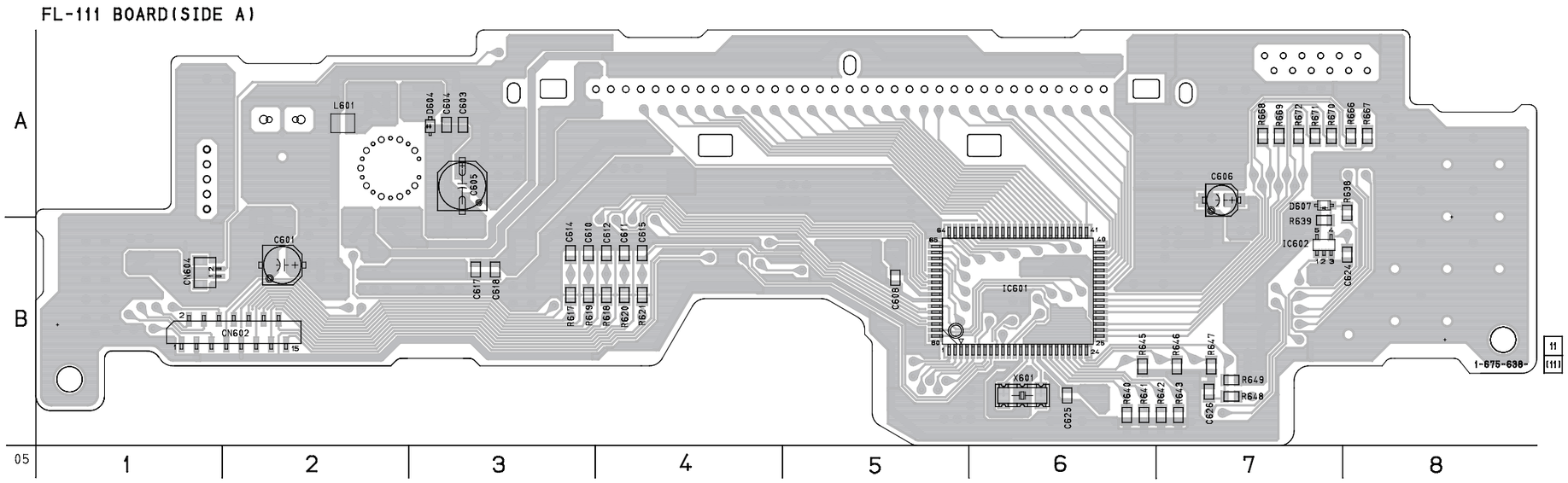
2.4 Vp-p (H)

VIDEO BUFFER
AU-222 (2/2)

FL-111 (IF CON) PRINTED WIRING BOARD

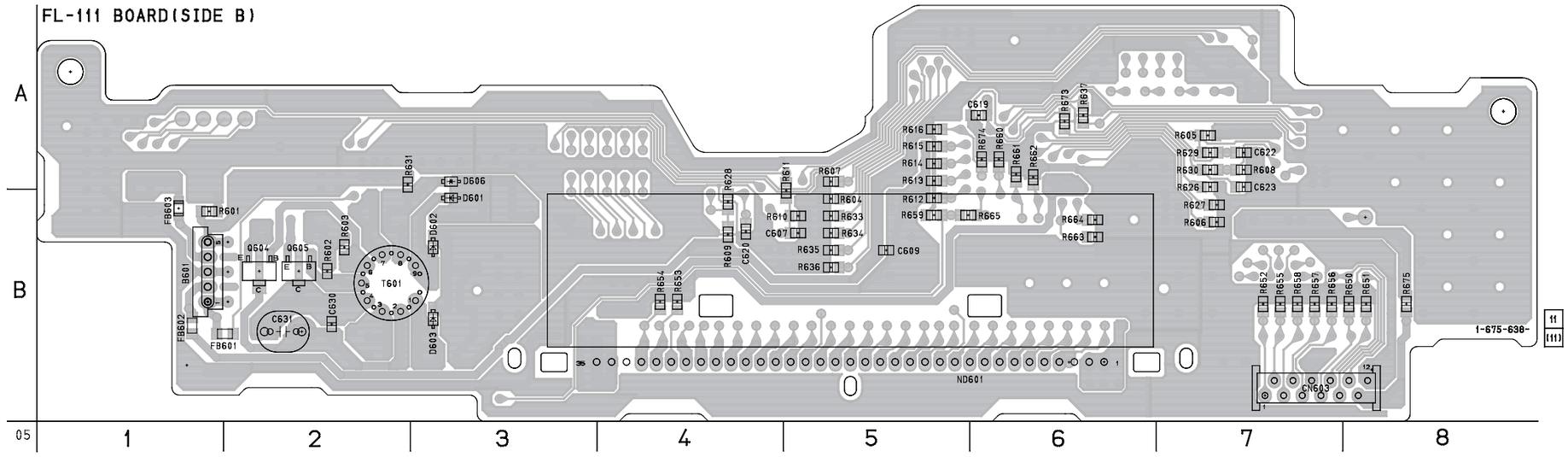
– Ref. No.: FL-111 board; 2,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.



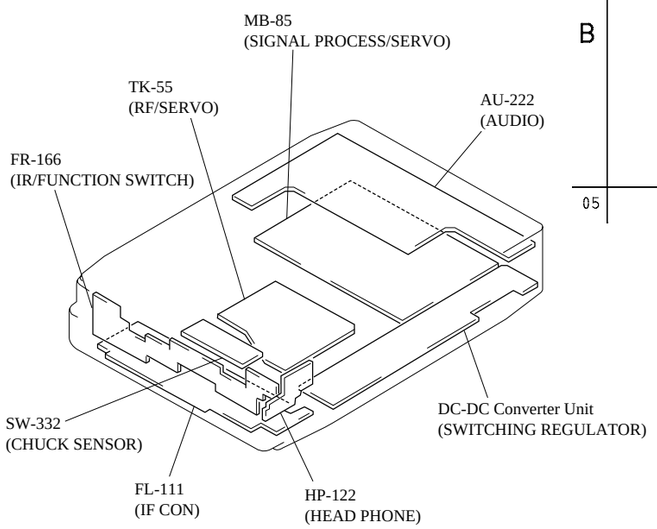
FL-111 BOARD (SIDE A)

CN602	B-2
CN604	B-1
D604	A-3
D607	A-7
IC601	B-6
IC602	B-7



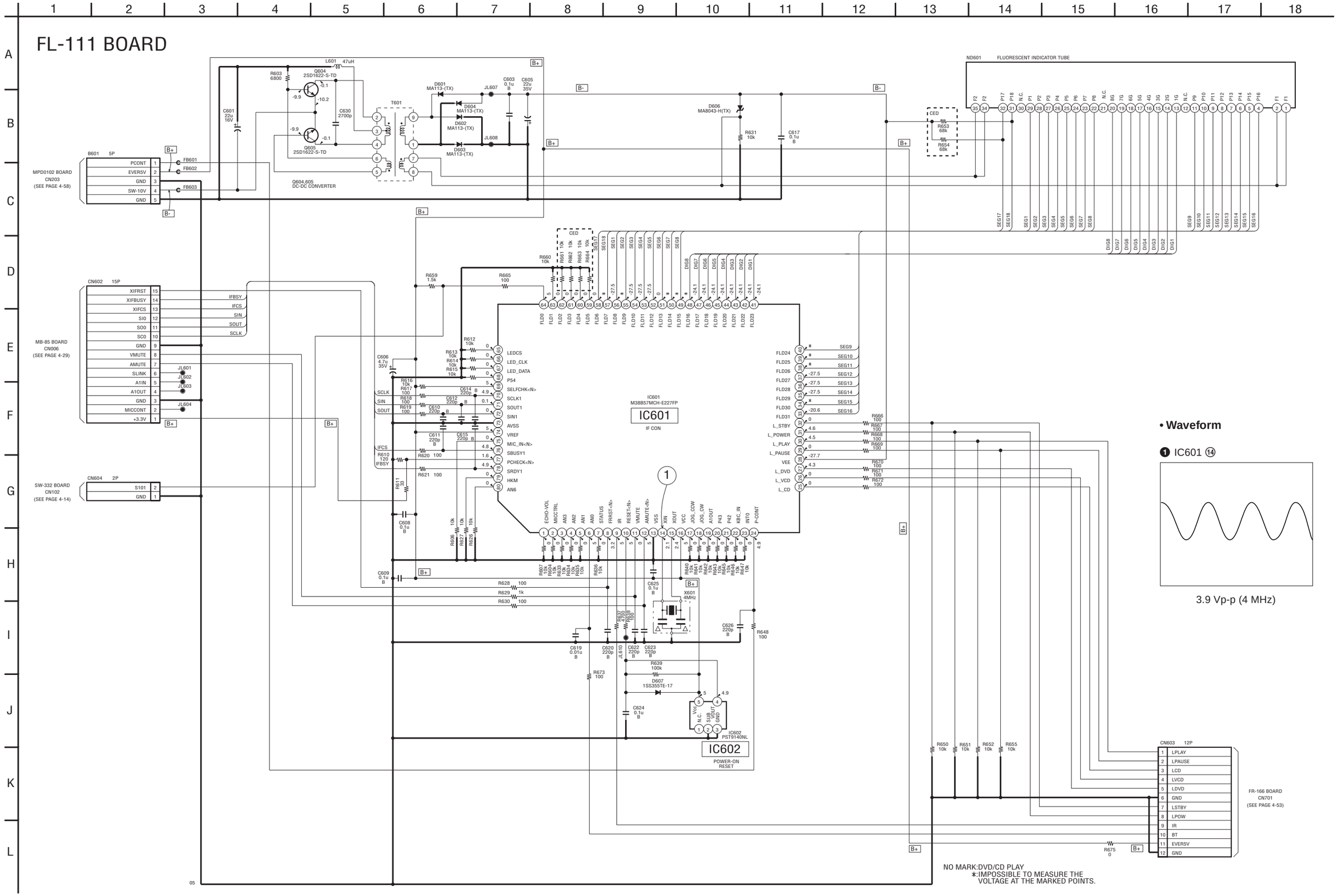
FL-111 BOARD (SIDE B)

CN603	B-7
D601	B-3
D602	B-3
D603	B-3
D606	A-3
Q604	B-2
Q605	B-2



FL-111 (IF CON) SCHEMATIC DIAGRAM

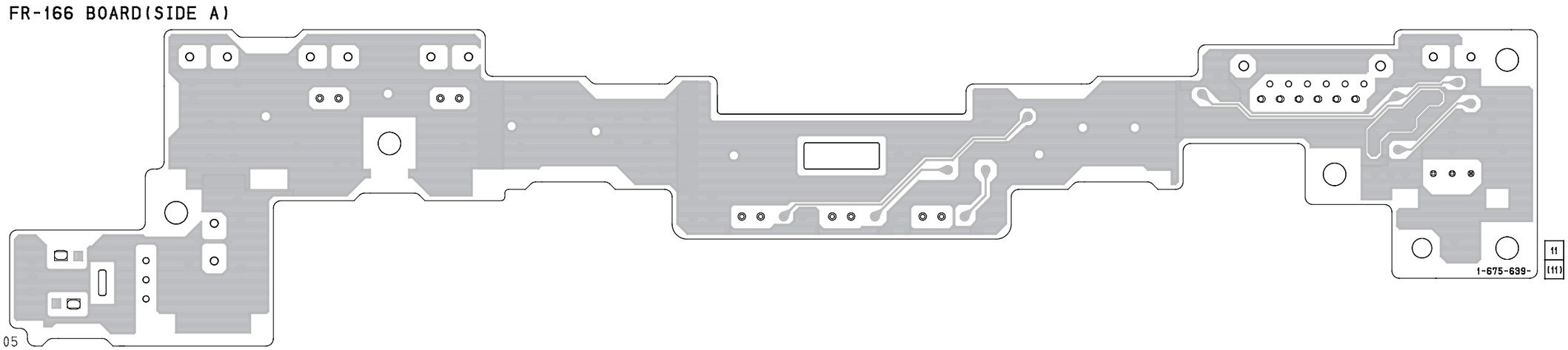
– Ref. No.: FL-111 board; 2,000 series –



There are few cases that the part isn't mounted in this model is printed on this diagram.

FR-166 (IR/FUNCTION SWITCH) PRINTED WIRING BOARD

– Ref. No.: FR-166 board; 2,000 series –

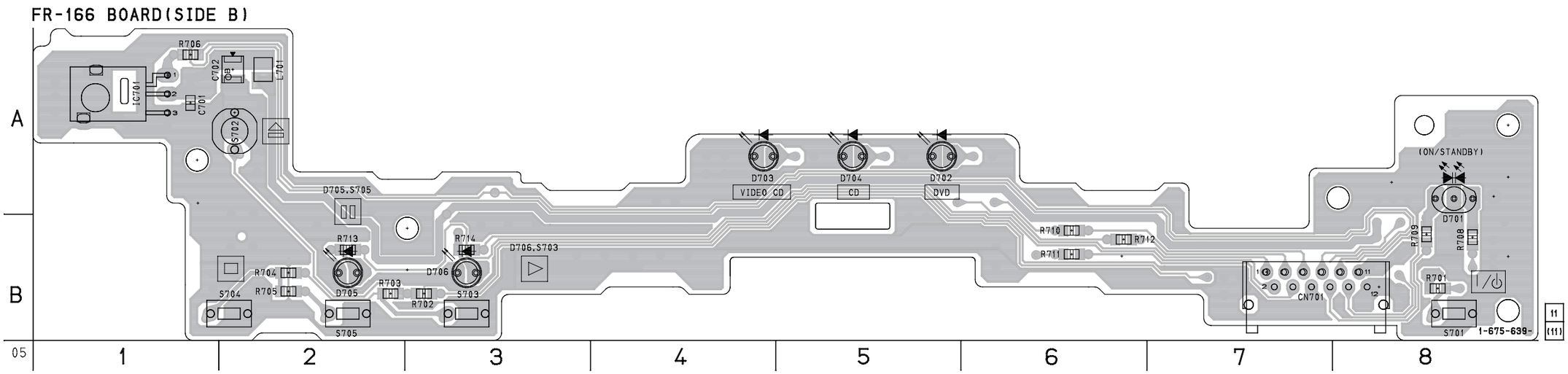


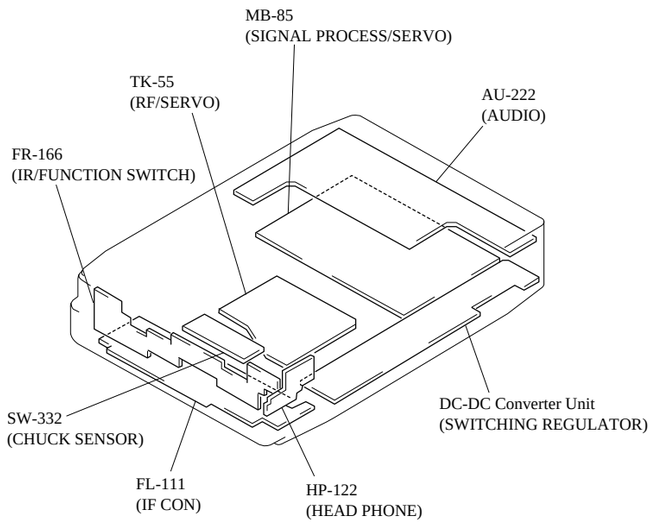
FR-166 BOARD (SIDE B)

CN701 B-7

D701 A-8
D702 A-5
D703 A-4
D704 A-5
D705 B-2
D706 B-3

IC701 A-1

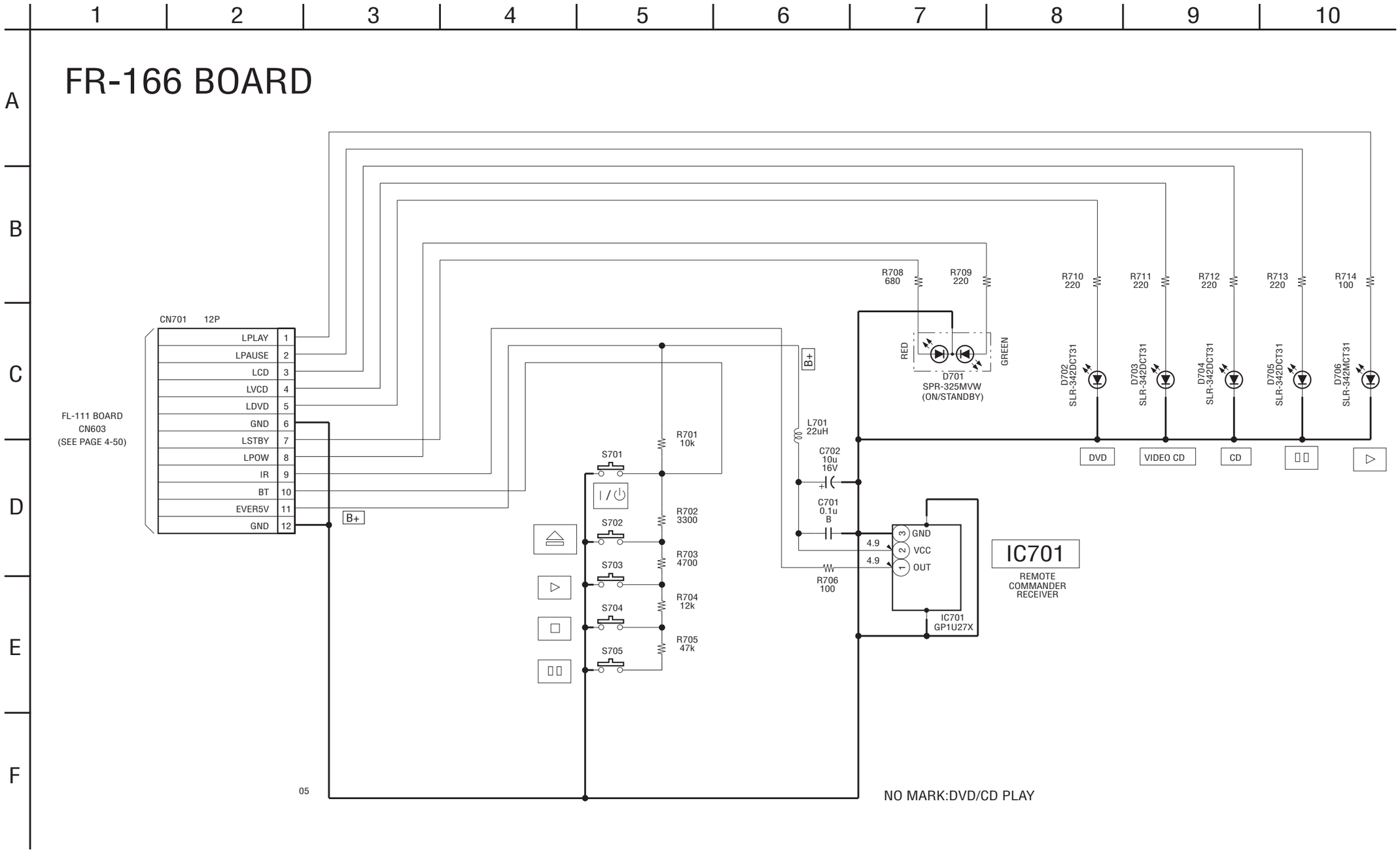




IR/FUNCTION SWITCH
FR-166

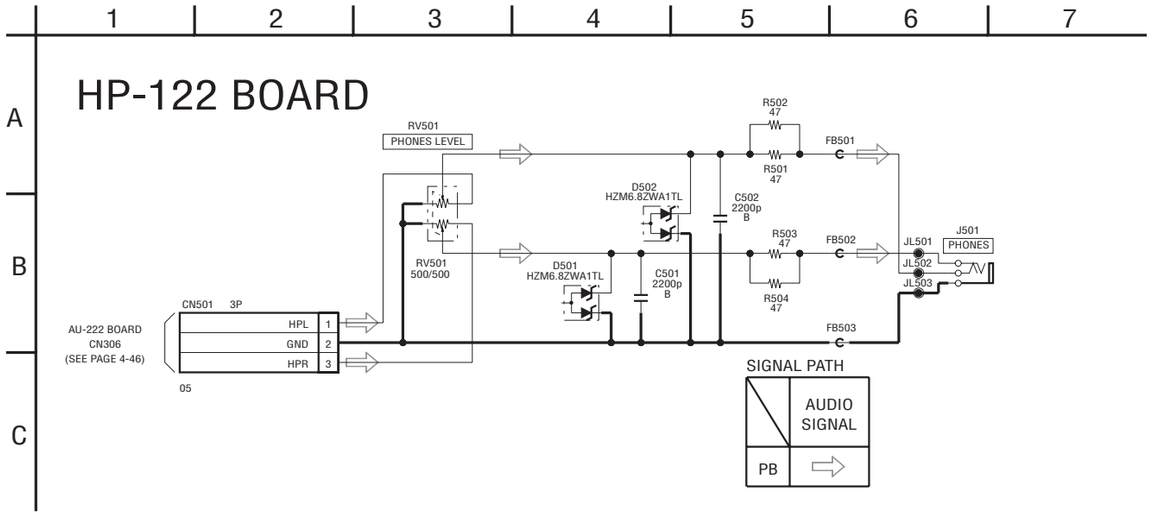
FR-166 (IR/FUNCTION SWITCH) SCHEMATIC DIAGRAM

– Ref. No.: FR-166 board; 2,000 series –

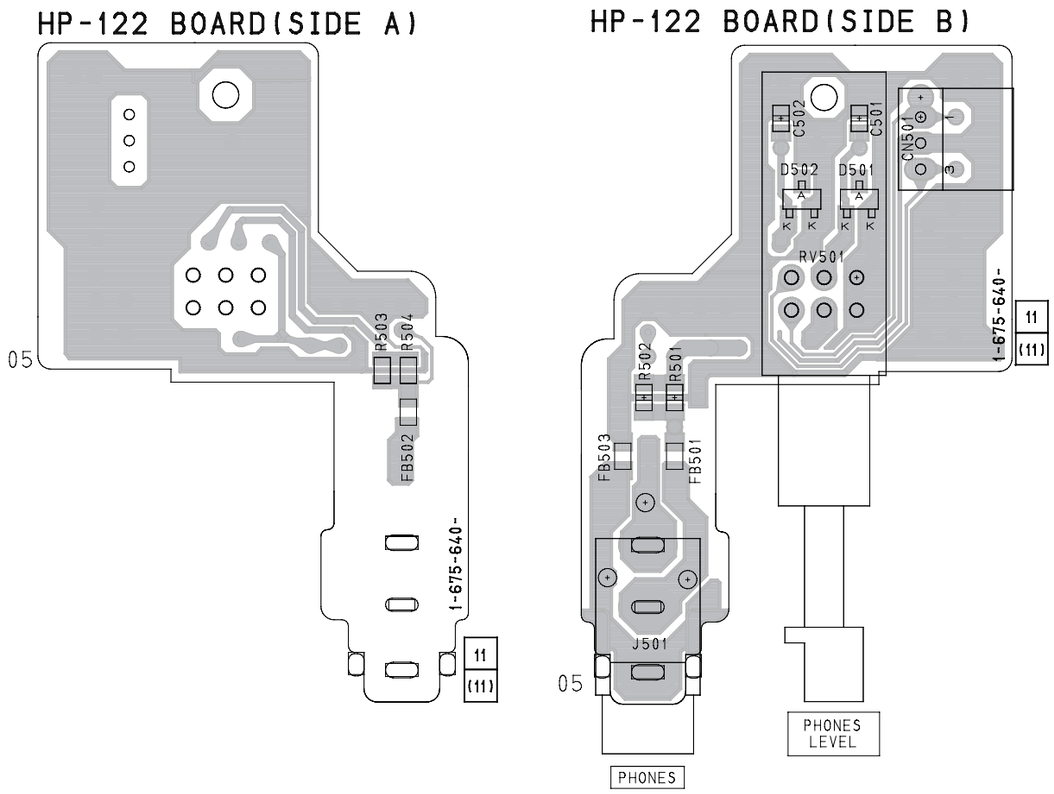


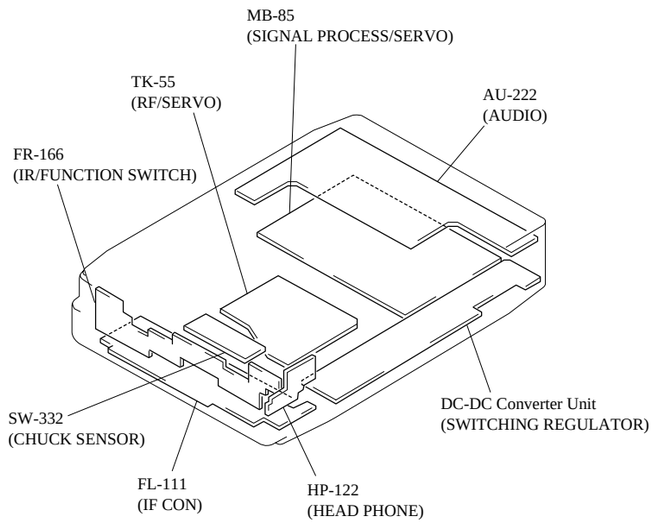
HP-122 (HEADPHONE) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

– Ref. No.: HP-122 board; 2,000 series –



There are few cases that the part isn't mounted in this model is printed on this diagram.

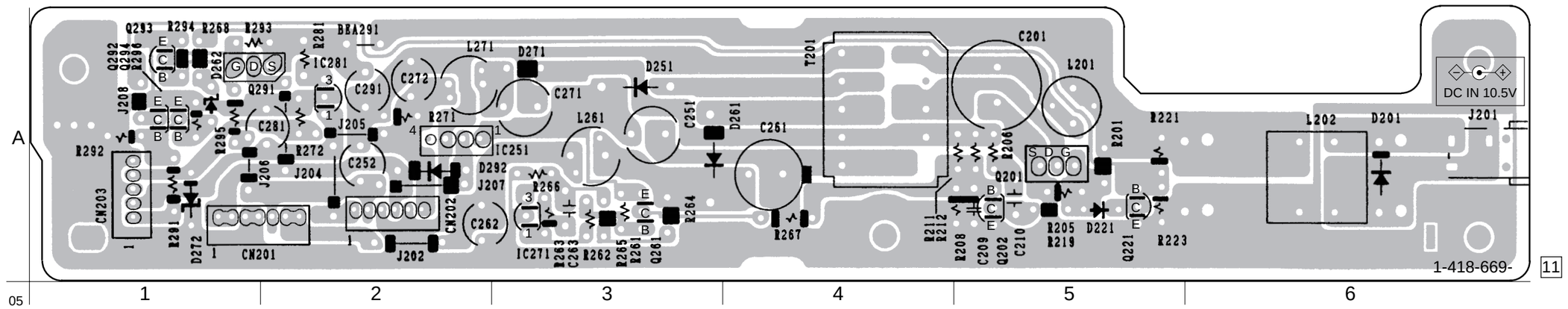




MPD0102 (SWITCHING REGULATOR) PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM
– Ref. No.: MPD0102 board; 6,000 series –

There are few cases that the part isn't mounted in this model is printed on this diagram.

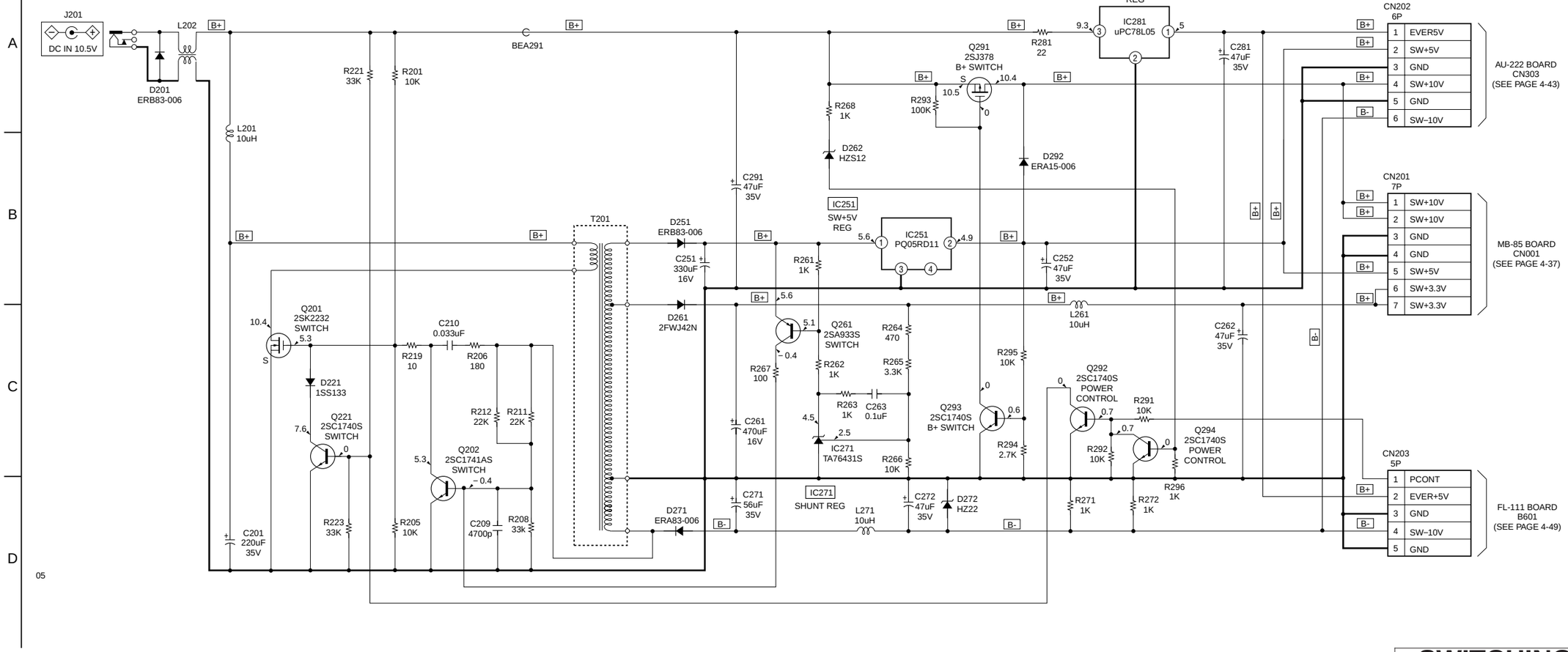
MPD0102 BOARD



MPD0102 BOARD

CN201	A-1
CN202	A-2
CN203	A-1
D201	A-6
D221	A-5
D251	A-3
D261	A-3
D262	A-1
D271	A-3
D272	A-1
D292	A-2
IC251	A-2
IC271	A-3
IC281	A-2
Q201	A-5
Q202	A-5
Q221	A-5
Q261	A-3
Q291	A-1
Q292	A-1
Q293	A-1
Q294	A-1

MPD0102 BOARD



5-1. SYSTEM CONTROL PIN FUNCTION (MB-85 BOARD IC202)

Pin No.	Pin name	I/O	Function
1	PB5	O	Analog filter gain control
2	PB6	O	VES gain control “H”: VES
3	PB7	O	Rear CH boost control “H”: rear boost
4	VCC3	-	Power supply
5	CLK	O	CPU clock out (25 MHz)
6	$\overline{CS5}$	O	Not used
7	$\overline{CS4}$	O	Chip select signal for ARP, SERVO DSP and HGA
8	$\overline{CS3}$	O	Chip select signal for SDRAM and AV DEC
9	$\overline{CS2}$	O	Chip select signal for REG and AV DEC
10	$\overline{CS1}$	O	Chip select signal for external SRAM
11	$\overline{CS0}$	O	Chip select signal for external FLASH ROM
12	$\overline{NMI}$	I	Not used (fixed at “H”)
13	$\overline{HST}$	I	Not used (fixed at “H”)
14	$\overline{RST}$	I	Reset signal input from IF CON
15	GND	-	Ground
16	MD0	I	Input of mode select 0 (fixed at “1”)
17	MD1	I	Input of mode select 1 (fixed at “0”)
18	MD2	I	Input of mode select 2 (fixed at “0”)
19	RDY	I	Wait signal input
20	P81	I	Test terminal (fixed at “H”)
21	P82	I	Test terminal (fixed at “L”)
22	$\overline{RD}$	O	Read enable signal output
23	$\overline{WR0}$	O	High byte write enable signal output (16 bit and 8 bit)
24	$\overline{WR1}$	O	Low byte write enable signal output (16 bit only)
25-32	D16-D23	I/O	Data bus D0-D7 (16 bit)
33-39	D24-D30	I/O	Data bus D8-D14 (16 bit), D0-D6 (8 bit)
40	GND	-	Ground
41	D31	I/O	Data bus D15 (16 bit), D7 (8 bit)
42	A00	O	Address bus A0
43	VCC5	-	Power supply
44-64	A01-A21	O	Address bus A1-A21
65	GND	-	Ground
66	P66	O	PLL IC control output “H”: DOUBLE
67	P67	I	DIAG mode signal input “L”: DIAG

Pin No.	Pin name	I/O	Function
68	EOP0	I	Not used
69	AVCC	-	Power supply
70	AVRH	-	Reference power supply (+3.3V)
71	AGND	-	Ground
72	AN0	I	Set of mode 0
73	AN1	I	Set of mode 1
74	AN2	I	Set of mode 2
75	AN3	I	Set of mode 3 (fixed at “H”)
76	SI0	I	Serial data input from IF CON and EEPROM
77	SO0	O	Serial data output to IF CON and EEPROM
78	SC0	O	Serial clock output to IF CON and EEPROM
79	SI1	I	Serial bus 1 (for data input)
80	SO1	O	Serial bus 1 (for data output)
81	SI2	I	Serial bus 2 (for data input)
82	SO2	O	Serial bus 2 (for data output)
83	PF7	O	Reset signal output
84	DACK1	O	Output of DMA-ACK 0 to AV DEC
85	DACK0	O	Output of DMA-ACK 1 to AV DEC
86	DREQ1	I	Input of DMA-REQ 0 from AV DEC
87	DREQ0	I	Input of DMA-REQ 1 from AV DEC
88	INT3	I	Input of interrupt from HGA
89	SC1	O	Serial clock output
90	GND	-	Ground
91	X1	O	Clock output (12.5MHz)
92	X0	I	Clock input (12.5MHz)
93	VCC5	-	Power supply
94	INT1	I	Input of interrupt ARP and SERVO DSP
95	INT0	I	Input of interrupt from AV DEC
96	PB0	I	Rear panel lime input select (“H”: DISC “L”: EXT)
97	PB1	O	Chip select signal to IF CON
98	PB2	O	Chip select signal to DAC (Lt and Rt)
99	PB3	O	Chip select signal to DAC (L and R)
100	PB4	O	DVD/CD select (“H”: 44.1kHz “L”: 48kHz)

SECTION 6
TEST MODE

6-1. GENERAL DESCRIPTION

The Test Mode allows you to make diagnosis and adjustment easily using the remote commander and monitor TV. The instructions, diagnostic results, etc. are given on the on-screen display (OSD).

6-2. STARTING TEST MODE

Press [TITLE], [CLEAR], [POWER] buttons on the remote commander in this order with the power of main unit in OFF status, and the Test Mode starts, then the menu shown below will be displayed on the TV screen. At the bottom of menu screen, the model name and revision number are displayed.
To execute each function, select the desired menu and press its number on the remote commander.
To exit from the Test Mode, press the POWER button.

```
Test Mode Menu

0. Syscon Diagnosis
1. Drive Auto Adjustment
2. Drive Manual Operation
3. Mecha Aging
4. Emergency History
5. Version Information
6. Video Level Adjustment
Exit: Power Key
_
Model   : DPX12xxxx
Revision: 1.xxxx
```

6-3. SYSCON DIAGNOSIS

The same contents as board detail check by serial interface can be checked from the remote commander.
On the Test Mode Menu screen, press [0] key on the remote commander, and the following check menu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
0. Quit
1. All
2. Version
3. Peripheral
4. Servo
5. Supply
6. AV Decoder
7. Video
8. Audio
_
```

0. Quit
Quit the Syscon Diagnosis and return to the Test Mode Menu.

1. All
All items continuous check
This menu checks all diagnostic items continuously. Normally, all items are checked successively one after another automatically unless an error is found, but at a certain item that requires judgment through a visual check to the result, the following screen is displayed for the key entry.

```
    ### Syscon Diagnosis ###

Diag All Check
No. 2 Version

 2-3. ROM Check Sum
Check Sum = xxxx



Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

For the ROM Check, the check sum calculated by the Syscon is output, and therefore you must compare it with the specified value for confirmation.
Following the message, press [NEXT] key to go to the next item, or [PREV] key to repeat the same check again. To quit the diagnosis and return to the Check Menu screen, press [STOP] or [ENTER] key. If an error occurred, the diagnosis is suspended and the error code is displayed as shown below.

```
    ### Syscon Diagnosis ###




 3-3. EEPROM Check
Error 03: EEPROM Write/Reed N
Address    : 00000001
Write Data : 2492
Read Data  : 2490
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

Press [STOP] key to quit the diagnosis, or [PREV] key to repeat the same item where an error occurred, or [NEXT] key to continue the check from the item next to faulty item.

Submenu
Selecting 2 and subsequent items calls the submenu screen of each item.
For example, if “5. Supply” is selected, the following submenu will be displayed.

```
    ### Syscon Diagnosis ###
           Check Menu
         No. 5 Supply
0. Quit
1. All
2. ARP Register Check
3. ARP to RAM Data Bus
4. ARP to RAM Address Bus
5. ARP RAM Check
_
```

0. Quit
Quit the submenu and return to the main menu.

1. All
All submenu items continuous check
This menu checks 2 and subsequent items successively. At the item where visual check is required for judgment or an error occurred, the checking is suspended and the message is output for key entry. Normally, all items are checked successively one after another automatically unless an error is found.

Selecting 2 and subsequent items executes respective menus and outputs the results.
For the contents of each submenu, see “Check Items List”.

General Description of Checking Method

2. Version

(2-2) Revision
ROM revision number is displayed.
Error: Not detected.
The revision number defined in the source file of ROM (IC205 or IC206) is displayed with four digits.

(2-3) ROM Check Sum
Check sum is calculated.
Error: Not detected.
The 8-bit data are added at addresses 0x000F0000 ~ 0x002EFFFF of ROM (IC205 or IC206) and the result is displayed with 4-digit hexadecimal number. Error is not detected. Compare the result with the specified value.

(2-4) Model Type
Model code is displayed.
Error: Not detected.
The model code read from EEPROM (IC201) is displayed with 2-digit hexadecimal number.

	Model Type	
Hong Kong, Singapore	8	1
Australian	8	2
EXCEPT Hong Kong, Singapore, Australian	8	3

(2-5) Region
Region code is displayed.
Error: Not detected.
The region code determined from the model code is displayed.

3. Peripheral

(3-2) Gate Array Check
Data write → read, and accord check
Error 02: Gate array write/read discord
Data 0x00~0xFF are written to the address 0xF of GA (IC601), then read and checked if they accord.

(3-3) EEPROM Check
Data write → read, and accord check
Error 03: EEPROM write/read discord
Data 0x9249, 0x2942, 0x4294 are written to addresses 0x00~0xFF of EEPROM (IC201), then read and checked. Before writing, the data are saved, then after checking, they are written to restore the contents of EEPROM.

4. Servo

(4-2) Servo DSP Check
Data write → read, and accord check
Error 12: Read data discord
Data 0x9249, 0x2942, 0x4294 are written to the address 0x602 of RAM in the Servo DSP (IC701), then read and checked.

(4-3) DSP Driver Test
Test signal data → DSP Driver
Error: Not detected.

Caution: Do not conduct this test with a mechanical deck connected.

The maximum voltage is applied to the Servo Driver IC (IC801, IC802). If mechanical deck is connected, the motor and optics could be damaged. Disconnect mechanical deck following the output message, then enter specified 4- or 5-digit number from the remote commander, and press the [ENTER]. The test is conducted only when the input data accord. Check the output level, then press the [NEXT] to finish the test.
This test is skipped if “All” is selected.

Supplement: How to disconnect mechanical deck
Disconnect flat cables connected to the CN002 and CN003 of MB-85 board. Also, disconnect harness from the CN011.

5. Supply

Caution: Do not conduct this check with a mechanical deck connected.
An access is made to the stream supply and servo control IC (IC303) and external RAM (IC304) using check data. If mechanical deck is connected, the motor and optics could be damaged. This check is also executed by the “All” menu item.

Supplement: How to disconnect mechanical deck
Disconnect flat cables connected to the CN002 and CN003 of MB-85 board. Also, disconnect harness from the CN011.

(5-2) ARP Register Check
Data write → read, and accord check
Error 08: ARP register write, and read data discord
Data 0x00 to 0xFF are written to the TMAX register (address 0xC6) in ARP (IC303), then they are read and checked.

(5-3) ARP to RAM Data Bus
Data write → read, and accord check
Error 09: ARP ←→ RAM data bus error
Data 0x0001 to 0x8000 where one bit each is set to 1 are written to the address 0 of RAM (IC304) connected to the ARP (IC303) through the bus, then they are read and checked. In case of discord, written bit pattern and read data are displayed. If data where multiple bits are 1 are read, the bits concerned may touch each other. Further, if data where certain bit is always 1 or 0 regardless of written data, the line could be disconnected or shorted.

(5-4) ARP to RAM Address Bus
Data write → other address read discord check
Error 10: ARP → RAM address bus error
Caution: Address and data display in case of an error is different from the display of other diagnosis (described later).
Before starting the test, all addresses of RAM (IC304) are cleared to 0x0000.
First, 0xA55A is written to the address 0x00000, and the address data are read and checked from addresses 0x00001 to 0x80000 while shifting 1 bit each. Next, the data at that address is cleared, and it is written to the address 0x00001, and read and checked in the same manner. This check is repeated up to the address 0x80000 while shifting the address data by 1 bit each.
If data other than 0 is read at the addresses except written address, an error is given because all addresses were already cleared to 0. In this check, the error display pattern is different from that of other diagnosis; read data, written address, and read address are displayed in this order. However, the message uses same template, and accordingly exchange Address and Data when reading. The following display, for example,

```
    ### Syscon Diagnosis ###



 5-4. ARP to RAM Address Bus
Error 10: ARP - RAM Address B
Address    : 0000A55A
Write Data : 00000000
Read Data  : 00080000
Press NEXT Key to Continue
Press PREV Key to Repeat
_
```

shows the data 0xA55A was read from address 0x00080000 though it was written to the address 0x00000000. This implies that these addresses are in the form of shadow. Also, if the read data is not 0xA55A, another error will be present.

(5-5) ARP RAM Check
Data write → read, and accord check
Error 11: ARP RAM read data discord
The program code data stored in ROM are copied to all areas of RAM (IC304) connected to the ARP (IC303) through the bus, then they are read and checked if they accord. If the detail check was selected initially, the data are written to all areas and read, then the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 11, and the test is suspended.

6. AV Decoder

(6-2) 1930 RAM
Data write → read, and accord check
Error 13: AVD RAM read data discord
The program code data stored in ROM (IC205 or IC206) are copied to all areas of RAM (IC402, IC403) connected to the AVD (IC401) through the bus, then they are read and checked if they accord. Further, the same test is conducted once again with the data where all bits are inverted between 1 and 0. If discord is detected, faulty address, written data, and read data are displayed following the error code 13, and the test is suspended.

(6-3) 1930 SP
ROM → AVD RAM → Video OUT
Error: Not detected.
The data including sub picture streams in ROM (IC205 or IC206) are transferred to the RAM (IC402, IC403) in AVD (IC401), and output as video signals from the AVD (IC401). They are output from all video terminals (Composite, Y/C) except EURO AV terminal.

7. Video

(7-2) Color Bar
AVD color bar command write → Video OUT
Error: Not detected.
The command is transferred to the AVD, and the color bar signals are output from video terminals.
They are output from all video terminals (Composite, Y/C) except EURO AV terminal.

8. Audio

(8-2) ARP → 1930
Error 14: ARP → 1930 video NG
15: ARP → 1930 audio NG

(8-3) Test Tone
A pink noise signal is output from the AVD (IC401) through optical coaxial digital terminal and analog audio terminal.
Error: Not detected.
All channels → 2ch Left → 2ch Right → Front Left → Front Right → Rear Left → Rear Right → Center → Sub Woofer are checked in this order.
Caution: Sub Woofer is checked only for low-frequency components, and no sound will be heard unless a proper super woofer is connected.

Check Items List

2) Version
(2-2) Revision
(2-3) ROM Check Sum
(2-4) Model Type
(2-5) Region

3) Peripheral
(3-2) Gate Array Check
(3-3) EEPROM Check

4) Servo
(4-2) Servo DSP Check
(4-3) DSP Driver Test

5) Supply
(5-2) ARP Register Check
(5-3) ARP to RAM Data Bus
(5-4) ARP to RAM Address Bus
(5-5) ARP RAM Check

6) AV Decoder
(6-2) 1930 RAM
(6-3) 1930 SP

7) Video
(7-2) Color Bar

8) Audio
(8-2) ARP → 1930
(8-3) Test Tone

Error Codes List

00: Error not detected
01: RAM write/read data discord
02: Gate array NG
03: EEPROM NG
08: ARP register read data discord
09: ARP ←→ RAM data bus error
10: ARP ←→ RAM address bus error
11: ARP RAM read data discord
12: Servo DSP NG
13: 1930 SDRAM NG
14: ARP → 1930 video NG
15: ARP → 1930 audio NG
16: 1910 UCODE download NG
17: System call error (function not supported)
18: System call error (parameter error)
19: System call error (illegal ID number)
20: System call error (time out)
90: Error occurred
91: User verification NG
92: Diagnosis cancelled

6-4. DRIVE AUTO ADJUSTMENT

On the Test Mode Menu screen, press [1] key on the remote commander, and the drive auto adjustment menu will be displayed.

```
  ## Drive Auto Adjustment ##

        Adjustment Menu

0. ALL
1. DVD-SL
2. CD
3. DVD-DL
4. SACD



                  Exit: RETURN
```

Normally, [0] is selected to adjust DVD (single layer), CD, DVD (dual layer), and SACD in this order. But, individual items can be adjusted for the case where adjustment is suspended due to an error. In this mode, the adjustment can be made easily through the operation following the message displayed on the screen.
The disc used for adjustment must be the one specified for adjustment. However, for SACD disc, use the player with initial data if the disc is not available.

0. ALL

Select [0] and press [ENTER] key, and the servo set data in EEPROM will be initialized. Then, 1. DVD-SL disc, 2. CD disc, 3. DVD-DL disc, and 4. SACD disc are adjusted in this order. Each time one disc was adjusted, it is ejected. Replace it with the specified disc following the message. Though the message to confirm whether discs other than SACD disc are adjusted is not displayed, you can finish the adjustment if pressing the [STOP] button. During adjustment of each disc, the measurement for disc type judgment is made. As automatic adjustment does not judge the disc type unlike conventional models, take care not to insert wrong type discs. Also, do not give a shock during adjustment.

1. DVD-SL (single layer)

Select [1], insert DVD single layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Single Layer Disc Adjustment Steps

1. SLED TILT Reset
2. Disc Check Memory SL
3. Wait 300 msec
4. Set Disc Type SL
5. LD ON
6. Spdl Start
7. Wait 1 sec
8. Focus Servo ON 0
9. Auto Track Offset Adjust
10. CLVA ON
11. Wait 500 msec
12. Tracking ON
13. Wait 1 sec
14. Sled ON
15. Check CLV Lock
16. Auto LFO Adjust
17. Auto Focus Offset Adjust
18. Auto Tilt Position Adjust
19. Auto Focus Gain Adjust
20. Auto Focus Offset Adjust
21. EQ Boost Adjust
22. Auto LFO Adjust
23. Auto Track Gain Adjust
    Search Check
24. 32Tj Fwd
25. 32Tj Rev
26. 500Tj Fwd
27. 500Tj Rev

28. All Servo Stop
29. Eep Copy Loop Filter Offset

2. CD

Select [2], insert CD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

CD Adjustment Steps

1. Sled Tilt Rest
2. Disc Check Memory CD
3. Wait 500 msec
4. Set Disc Type CD
5. LD ON
6. Spdl Start
7. Wait 500 msec
8. Focus Servo ON 0
9. Auto Track Offset Adjust

10. CLVA ON
11. Wait 500 msec
12. Tracking ON
13. (TC Display Start)
14. Wait 1 sec
15. Jitter Display Start
16. Sled ON
17. Check CLV ON
18. Auto LFO Adjust
19. Auto Focus Offset Adjust
20.
21. Auto Focus Gain Adjust
22. Auto Focus Offset Adjust
23. Eq Boost Adjust
24. Auto LFO Adjust
25. Auto Track Gain Adjust
    Search Check
26. 32Tj Fwd
27. 32Tj Rev
28. 500Tj Fwd
29. 500Tj Rev

30. All Servo Stop

3. DVD-DL (dual layer)

Select [3], insert DVD dual layer disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM.

DVD Dual Layer Disc Adjustment Steps

1. Sled Tilt Reset
2. Disc Check Memory DL
3. Wait 500 msec
4. Set Disc Type DL
5. LD ON
6. Spdl Start
7. Wait 1 sec
   Layer 1 Adjust
8. Focus Servo ON 0
9. Auto Track Offset Adjust

10. Clva ON
11. Wait 500 msec
12. Tracking ON
13. Wait 500 msec
14. Sled ON
15. Check CLV Lock
16. Auto Loop Filter Offset Auto Focus Adjust
17.
18. Auto Focus Gain Adjust
19. Auto Focus Offset Adjust
20. Eq Boost Adjust
21. Auto Loop Filter Offset
22. Auto Track Gain Adjust
    Search Check
23. 32Tj Fwd
24. 32Tj Rev
25. 500Tj Fwd
26. 500Tj Rev
    Layer 0 Adjust
27. Fj (L1 -> L0)
28. Auto Track Offset Adjust L0

29. Clva ON
30. Wait 500 msec
31. Tracking ON
32. Wait 500 msec
33. Sled ON
34. Check CLV Lock
35. Auto Focus Filter Offset
36. Auto Focus Adjust
37.
38. Auto Focus Gain Adjust
39. Auto Focus Offset Adjust
40. Eq Boost Adjust
41. Auto Loop Filter Offset
42. Auto Track Gain Adjust
    Search Check
43. 32Tj Fwd
44. 32Tj Rev
45. 500Tj fwd
46. 500Tj Rev
    Layer Jump Check
47. Lj (L0 -> L1)
48. Lj (L1 -> L0)

49. All Servo Stop

4. SACD

Select [4], insert SACD disc, and press [ENTER] key, and the adjustment will be made through the following steps, then adjusted values will be written to the EEPROM. However, if SACD disc is not available, use the player with initial data, skipping the SACD adjustment. In this case, you can finish the adjustment if pressing the [STOP] button.

SACD Adjustment Steps
1. Sled Tilt Reset
2. Set Disc Type CD
3. LD ON
4. Spdl Start
5. Wait 500 msec
6. Focus Servo ON 0
7. Auto track Offset Adjust
8.
9. CLVA ON
10. Wait 500 msec
11. Tracking ON
12. Wait 1 sec
13. Sled ON
14. Check CLV ON
15. Auto Focus Offset Adjust
17.
18. Auto Focus Gain Adjust
19. Auto Focus Offset Adjust
20. Eq Boost Adjust
21. Auto LFO Adjust
22. Auto Track Gain Adjust

23. 32Tj Fwd
24. 32Tj Rev
25. 500Tj Fwd
26. 500Tj Rev

27. All Servo Stop

6-5. DRIVE MANUAL OPERATION

On the Test Mode Menu screen, select [2], and the manual operation menu will be displayed. For the manual operation, each servo on/off control and adjustment can be executed manually.

```
  ## Drive Manual Operation ##

         Operation Menu
1. Disc type
2. Servo Control
3. Track/Layer Jump
4. Manual Adjustment
5. Auto Adjustment
6. Memory Check

0. Disc Check Memory

                 Exit: Return
```

In using the manual operation menu, take care of the following points. These commands do not provide protection, thus requiring correct operation. The sector address or time code field is displayed when a disc is loaded.

1. Set correctly the disc type to be used on the Disc Type screen.
   The disc type must be set after a disc was loaded.
   The set disc type is cleared when the tray is opened.
2. After power ON, if the Drive Manual Operation was selected, first perform “Reset SLED TILT” by opening 1. Disc Type screen.
3. In case of an alarm, immediately press the [STOP] button to stop the servo operation, and turn the power OFF.

Basic operation (controllable from front panel or remote commander)

[POWER]	Power OFF
[STOP]	Servo stop
[OPEN/CLOSE]	Stop+Eject/Loading
[RETURN]	Return to Operation Menu or Test Mode Menu
[NEXT], [PREV]	Transition between sub modes of menu
[1] to [9], [0]	Selection of menu items
Cursor UP/DOWN	Increase/Decrease in manually adjusted value

0. Disc Check Memory

```
          Disc Check



1. SL Disc Check
2. CD Disc Check
3. DL Disc Check



0. Reset SLED TILT
```

On this screen, the mirror time is measured to judge the disc and it is written to the EEPROM. First load DVD SL disc and press [1], next load CD disc and press [2], and finally load DVD DL disc and press [3].
The adjustment must be executed more than once after default data were written. External vibration or shock to the player must not be given. Reference value for DVD is from 10 to 20, and for CD, from 28 to 4F.
Check that the value of CD is larger than that of DVD.
When those values are beyond a range perform this adjustment again.
From this screen, you can go to another mode by pressing [NEXT] or [PREV] key, but you cannot enter this mode from another mode. You can enter this mode from the Operation Menu screen only.

1. Disc Type

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
                        EMG. 00
```

On this screen, select the disc type. To select the disc type, press the number of the loaded disc. The selected disc type is displayed at the bottom. Selecting [1] automatically selects and displays the disc type. In case of wrong display, retry “Disc Check Memory”. Also, opening the tray causes the set disc type to be cleared. In this case, set the disc type again after loading.
In performing manual operation, the disc type must be set.
Once the disc type has been selected, the sector address or time code display field will appear as shown below. These values are displayed when PLL is locked.

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
       SA._____ SI.____ EMG. 00
DVD SL 12 cm
```

Display when DVD SL 12cm disc was selected

```
          Disc Type
1. Disc Type Auto Check
2. DVD SL   12 cm
3. DVD DL   12 cm
4. CD       12cm
5. SACD     12 cm
6. DVD SL   8 cm
7. DVD DL   8 cm
8. CD       8 cm
9. SACD     8 cm
0. Reset SLED TILT
        TC.___:___:___ EMG. 00
CD   12 cm
```

Display when CD 12cm disc was selected

[0] Reset SLED TILT — Reset the Sled and Tilt to initial position.

[1] Disk Type Check — Judge automatically the loaded disc. As the judged result is displayed at the bottom of screen, make sure that it is correct.
If Disc Check Memory menu has not been executed after EEPROM default setting, the disc type cannot be judged. In this case, return to the initial menu and make a check for three types of discs (SL, DL, CD).

[2] to [9] — Select the loaded disc. The adjusted value is written to the address of selected disc. No further entry is necessary if [1] was selected.

2. Servo Control

```
          Servo Control
1. LD         Off R.Sled FWD
2. SP         Off L.Sled REV
3. Focus      Off
4. TRK.       Off
5. Sled       Off
6. CLVA       Off
7. FCS. Srch Off



0. Reset SLED TILT
       SA._____ SI.____ EMG. 00
DVD SL 12 cm
```

On this screen, the servo on/off control necessary for replay is executed. Normally, turn on each servo from 1 sequentially and when CLVA is turned on, the usual trace mode becomes active. In the trace mode, DVD sector address or CD time code is displayed. This is not displayed where the spindle is not locked.
The spindle could run overriding the control if the spindle system is faulty or RF is not present. In such a case, do not operate CLVA.

0	Reset SLED TILT	Reset the Sled and Tilt to initial position.
1	LD	Turn ON/OFF the laser.
2	SP	Turn ON/OFF the spindle.
3	Focus	Search the focus and turn on the focus.
4	TRK	Turn ON/OFF the tracking servo.
5	Sled	Turn ON/OFF the sled servo.
6	CLVA	Turn ON/OFF normal servo of spindle servo.
7	FCS. Srch	Apply same voltage as that of focus search to the focus drive to check the focus drive system.
→	Sled FWD	Move the sled outward. Perform this operation with the tracking servo turned off.
←	Sled REV	Move the sled inward. Perform this operation with the tracking servo turned off.
↑	Tilt UP	Move the tilt upward.
↓	Tilt DOWN	Move the tilt downward.

The following menus are normally not used.

3. Track/Layer Jump

4. Manual Adjustment

5. Auto Adjustment

The persons who do not know well about these menus should not use them.

6. Memory Check

```
EEPROM DATA
                CD       - DVD -
ID No. 00      SACD     SL  L0  L1
Focus Gain     xx xx    xx  xx  xx
TRK. Gain      xx xx    xx  xx  xx
Focus Offset   xx xx    xx  xx  xx
TRK. Offset    xx xx    xx  xx  xx
L. F. Offset   xx xx    xx  xx  xx
EQ Boost       xx xx    xx  xx  xx
Jitter         xx xx    xx  xx  xx
Mirror Time    xx xx    xx  xx  xx
_
CLEAR: Default Set
```

This screen displays current servo adjusted data stored in the EEPROM. Though adjusted data can be initialized with the CLEAR key, they cannot be restored after initialization.
So, before clearing, make a note of the adjusted data.
For reference, the drive has been designed so that the gain center value is 20 and offset value is 80. Other values will be in a range of 10 to 80. If extreme value such as 00 or FF is set, adjustment will be faulty. In such a case, check for disc scratch or cable disconnection, then perform adjustment again.

6-6. MECHA AGING

```
      ### Mecha Aging ###



Press OPEN key



Abort: STOP key
```

On the Test Mode Menu screen, selecting 3 executes the aging of mechanism. First, open the tray and load a disc. Press the PLAY key, and the aging will start. When the tray is closed, the disc type and size are judged and displayed. During aging, the repeat cycle is displayed. Aging can be aborted at any time by pressing the STOP key. After the operation has stopped, unload the disc and press again the STOP key or the RETURN key to return to the Test Mode Menu.

6-7. EMERGENCY HISTORY

```
      ### MEG. History ###

Laser Hours     CD   xxxxxxxh
                DVD  xxxxxxxh

1. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

2. 00 00 00 00  00 00 00 00
   00 00 00 00  00 00 00 00

Select: 1 – 9  Scroll: UP/DOWN
(1: Last EMG.)  Exit: Return
```

On the Test Mode Menu screen, selecting 4 displays the information such as servo emergency history. The history information from last 1 up to 10 can be scrolled with ↑ key or ↓ key. Also, specific information can be displayed by directly entering that number with ten keys.

The upper two lines display the laser ON total hours. Data below minutes are omitted.

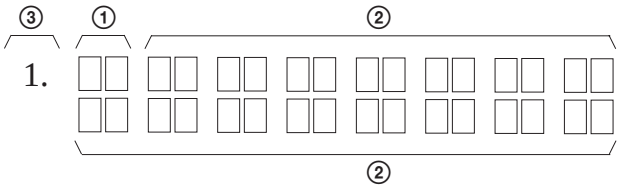
Clearing History Information

◎ Clearing laser hours
Press DISPLAY and CLEAR keys in this order.
Both CD and DVD data are cleared.

◎ Clearing emergency history
Press TITLE and CLEAR keys in this order.

◎ Initializing set up data
Press DVD and CLEAR keys in this order.
The data have been initialized when “Set Up Initialized” message is displayed. The EMG. History screen will be restored soon.

How to see Emergency History



① : Emergency Code
② : Don't Care
These codes are used for verification of software designing.
③ : Historical order 1 to 9

Emergency Codes List

10: Communication to IC001 (TK-55 board) failed.
11: Each servo for focus, tracking, and spindle is unlocked.
12: Communication to EEPROM, IC201 (MB-85 board) failed.
13: Writing of hours meter data to EEPROM, IC201 (MB-85 board) failed.
14: Communication to Servo DSP IC701 (MB-85 board) failed, or Servo DSP is faulty.
20: Initialization of tilt servo and sled servo failed. They are not placed in the initial position.
21: Tilt servo operation error
22: Syscon made a request to move the tilt servo to wrong position.
23: Sled servo operation error
24: Syscon made a request to move the sled servo to wrong position.
30: Tracking balance adjustment error
31: Tracking gain adjustment error
32: Focus balance adjustment error
33: Focus bias adjustment error
34: Focus gain adjustment error
35: Tilt servo adjustment error
36: RF equalizer adjustment error
37: RF group delay adjustment error
38: Jitter value after adaptive servo operation is too large.
40: Focus servo does not operate.
41: With a dual layer (DL) disc, focus jump failed.50: CLV (spindle) servo does not operate.
51: Spindle does not stop.
60: With a DVD disc, Syscon made a request to seek nonexistent address.
61: With a CD disc, Syscon made a request to seek nonexistent address.
62: With a CD disc, Syscon made a request to seek nonexistent track No. and index No.
63: With a DVD disc, seeking of target address failed.
64: With a CD disc, seeking of target address failed.
65: With a CD disc, seeking of target index failed.
70: With a DVD disc, physical information data could not be read.
71: With a CD disc, TOC data could not be read.
80: Disc type judgment failed.
81: As disc type judgment failed, retry was repeated.
82: As disc type judgment failed, a measurement error occurred.
83: Disc type could not be judged within the specified time.
84: Illegal command code was received from Syscon.
85: Illegal command was received from Syscon.

6-8. VERSION INFORMATION

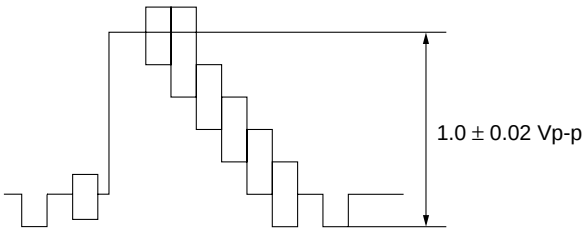
```
   ## Version Information ##

IF con.    Ver. x. xxx (xxxx)
           Group    00

SYScon.    Ver. x. xxx (xxxx)
           Model    xx
           Region   0x
           SW1      ??
           SW2      ??

Exit: RETURN
```

On the Test Mode Menu screen, selecting [5] displays the ROM version and region code.
The parenthesized hexadecimal number in version field is checksum value of ROM.

6-9. VIDEO LEVEL ADJUSTMENT

On the Test Mode Menu screen, selecting [6] displays color bars for video level adjustment. During display of color bars, OSD disappears but the menu screen will be restored if pressing any key.

Measurement point : LINE OUT VIDEO
(75 Ω terminating resistance)
Measuring instrument : Oscilloscope
Adjustment device : RV401 on MB-85 board
Specified value : 1.0 ± 0.02 Vp-p



6-10. IF CON SELF DIAGNOSTIC FUNCTION

1. FRONT BOARD TEST MODE

The front board test mode is the IF CON self diagnostic mode. The IF CON can diagnose the functions of the front panel boards that the IF CON controls. Normally, the IF CON makes a serial communication with the SYSTEM CONTROL and operates following thecommands from the SYSTEM CONTROL, but in the Test mode, the IF CON operates independently from the SYSTEM CONTROL.

In the Test mode, the following functions can be checked.

1. Button function
2. Remocon receiving function
3. SYSTEM CONTROL-IF CON serial communication
4. Direct search dial function
5. Click shuttle function
6. Fluorescent display tube lighting check
   Grid check
   Anode check
7. LED control function

In the Test mode, the set operates same as usual, except voltage monitoring, communication monitoring, display of fluorescent display tube, and LED control.

1. The routine that monitors +3.3 V (PCONT) of MB-85 board is not provided.
2. The monitoring timer for serial communication with the SYSTEM CONTROL is not provided. The set is not placed in the Standby mode, even if the communication with SYSTEM CONTROL is normal.
3. Display of fluorescent display tube (normally, display is made following the commands from SYSTEM CONTROL)
4. LED control (normally, control is made following the commands from SYSTEM CONTROL)

2. HOW TO ENTER THE TEST MODE

The set must be placed in the Standby mode (red LED lights up). In the standby mode, press the [RETURN] key, then the [SET UP] key on the remocon while pressing the [STOP] button on the set, so that the set enters the test mode.

When the Test mode becomes active, the automatic display sequence of the FL display tube starts.

1. LEDs and FL display tube all light up for about 5 seconds.
2. Then, the prototypical model name is displayed.
   (This model name is a typical name of the series. As the button arrangement varies depending on the model, make sure the difference.)

Display	Model
DPX-1290	DVP-F11

3. Last updating date of the program is displayed.
   Example: 981211
4. Following the “GRID TEST” display, odd grids and even grids are blinking alternately (3 times).
5. Following the “ANODE TEST” display, even anodes and odd anodes are blinking alternately (3 times). For the FL display tube type A, even and odd numeric parts of music calendar are blinking alternately (3 times).
6. All light-up mode restores.

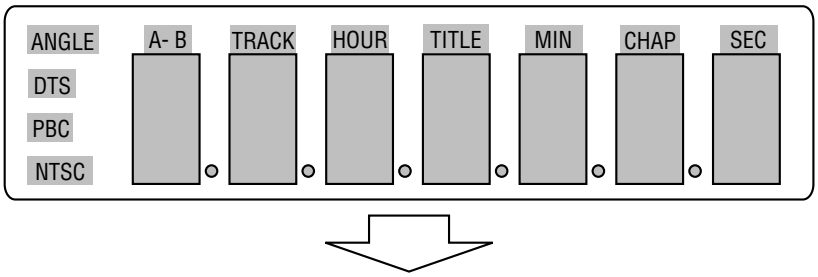
Steps 1 through 6 are repeated. (Refer to “FLD Auto Test Operation” on page 6-12)

3. HOW TO EXIT FROM THE TEST MODE

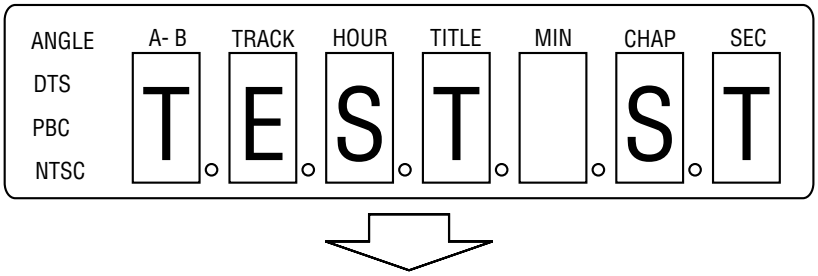
Press the [POWER] buttons on the set and Remocon, and the FL display tube turns off and the Standby mode is restored where only the red POWER LED lights up. This is the case where the SYSTEM CONTROL and IF CON are communicating normally. To forcibly activate the Standby mode, press the [POWER] button together with the [STOP] button.

FLD Auto Test Operation

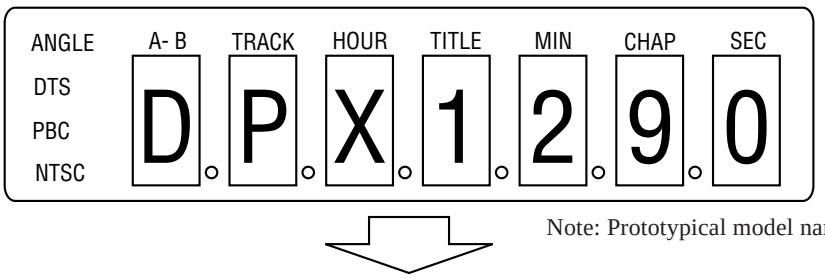
① FLD all light up (5 sec)



② TEST START display (2 sec) This is not displayed after second and subsequent tests.

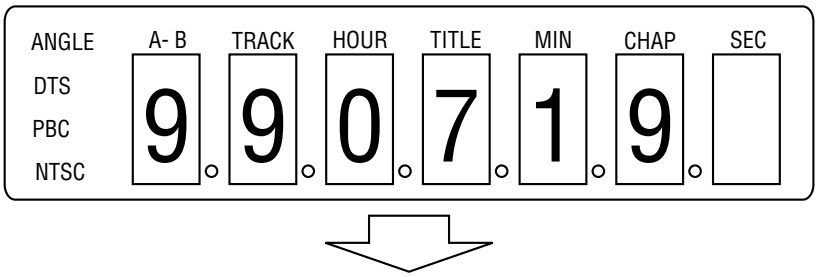


③ Model display (2 sec)

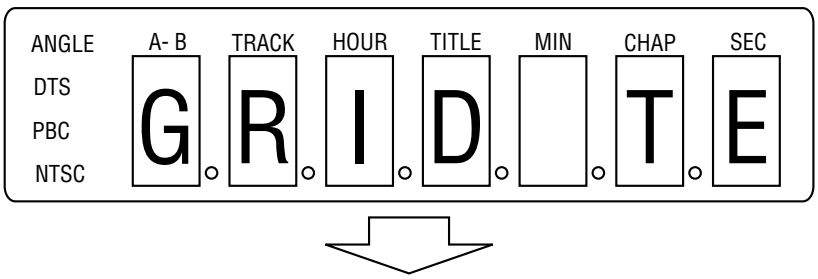


Note: Prototypical model name of the series is displayed.

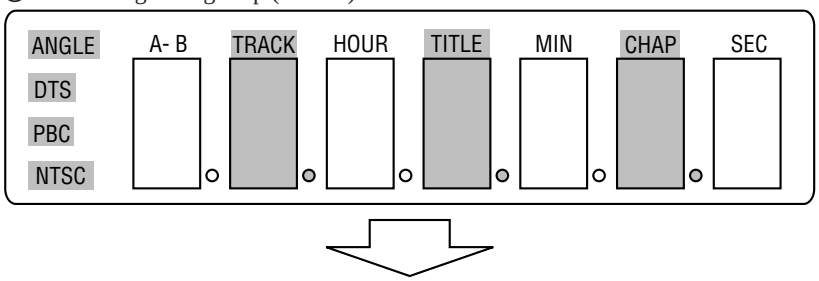
④ Date display (2 sec) Program updating date is displayed.



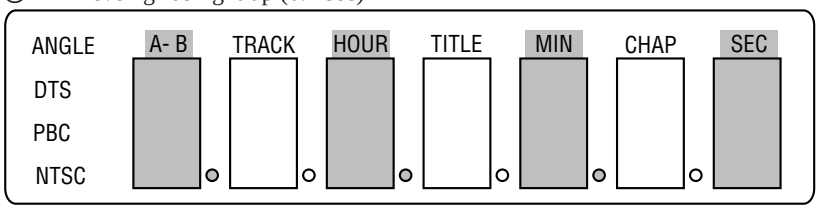
⑤ GRID TEST start display (1 sec)



⑥ FLD odd grids light up (0.7 sec)

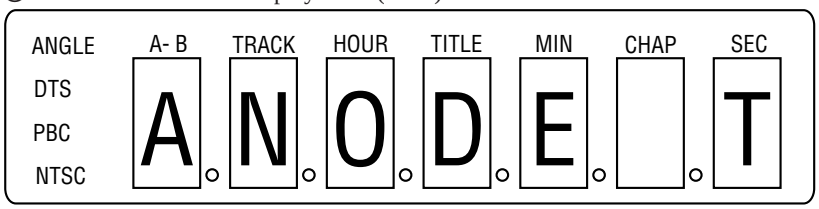


⑦ FLD even grids light up (0.7 sec)

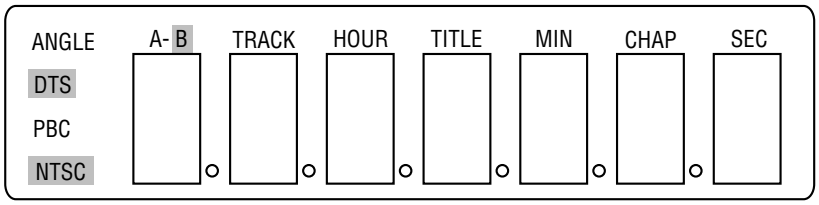


Note: Displays of ⑥ and ⑦ are repeated three times.

⑧ FLD ANODE TEST display No.1 (1 sec)

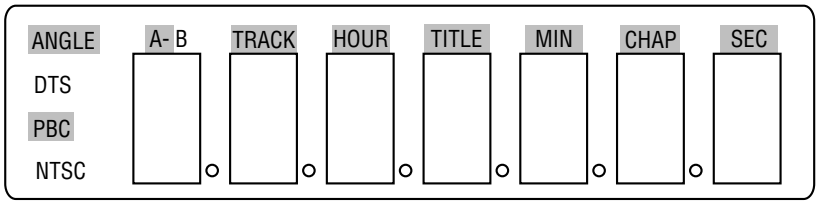


⑨ FLD even anodes light up (0.7 sec)



Note: Also, even anodes of alphanumeric section light up.

⑩ FLD odd anodes light up (0.7 sec)



Note: Also, odd anodes of alphanumeric section light up.
Note: Displays of ⑨ and ⑩ are repeated three times.

Hence, the operations of ① through ⑩ arerepeated.
However, ② is not displayed after the second and subsequent tests.

4. DESCRIPTION OF IF CON FUNCTION CHECK MODE

1. Button Function

In the Test mode, press any button (except POWER button) on the set. This operation terminates the automatic display test mode of the FL display tube. During the time that the button is pressed, the function name of the pressed button is displayed on the FL display tube, and "NOTHING" is displayed if releasing the button. For the button names displayed, refer to the following table.
For the illuminated button (LED built in), it turns on and off alternately each time it is pressed. For the multi-channel LED (blue LED), it blinks when the "RETURN" button is pressed because its dedicated button is not provided.

	Input Voltage [V]	IC601: Pin No. (Signal)
		Pin ⑥ (AN0)
1	0	POWER
2	0.65	OPEN/CLOSE
3	1.24	PLAY
4	1.88	STOP
5	2.41	PAUSE

The direction buttons are used to enter special modes.

- ↑ : FL display tube grid check
- ↓ : LED check
- ← : Direct search dial check
- → : FL display tube anode check

The buttons are all checked with the voltage at the A/D port. The reference voltage of A/D port is ever 5V. The voltage is calculated at 10bit accuracy and evaluated whether same voltage can be obtained in two-time operations to eliminate the chattering.
For the button check by the IF CON, a dead zone is provided, and if voltage in the dead zone is entered, "IGNORE" is displayed.

2. Remocon Receiving Function

Upon reception of a code from the Remocon when "NOTHING" is displayed, the function name of Remocon code is displayed on the FL display tube. The codes that can be received are DVD category codes only. The "DISPLAY" on Remocon functions to change over the function name display and the code display. In the code display mode, "REM NO xx" is displayed. A xx part is the received code in Hex notation. It is FF when a Remocon code is not received.

3. SYSTEM CONTROL-IF CON Serial Communication

Normally, two-way communication at 24ms interval is made between IF CON and SYSTEM CONTROL. Whether this communication is carried out normally can be checked easily. When "NOTHING" is displayed, OFF display of "ANGLE", "DTS", "PBC", and "NTSC" characters on the left side of FL display tube indicates that a serial communication with the SYSTEM CONTROL is carried out normally. ON display of these characters indicates that the communication with the SYSTEM CONTROL is not made.
However, the communication is not made for several seconds after the Test mode became active (until MB-85 board is initialized), and these characters may turn on. This status is normal.

4. Direct Search Dial

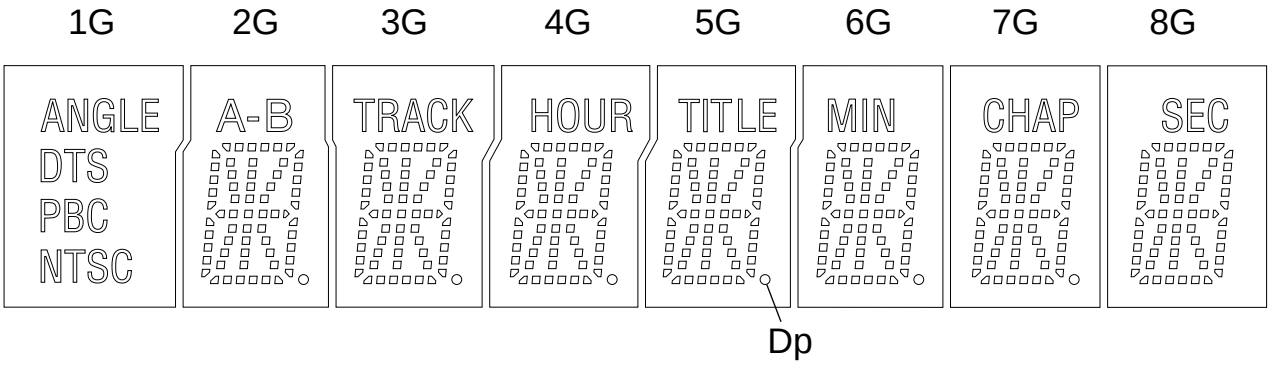
The grid X part displays images that rotate. At the same time, the numbers on music calendar shift toward the direction in which the direct search dial was rotated.
(Though this is displayed on the models which do not have the dial, it does not function because of no dial.)

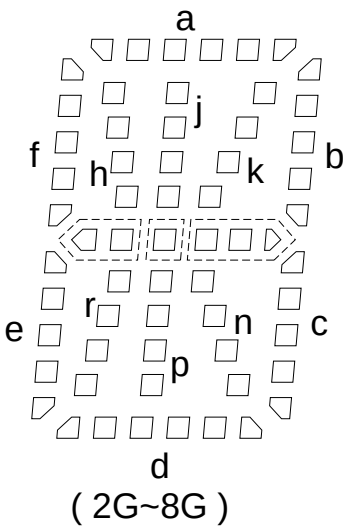
5. Click Shuttle

Whether the IF CON can judge the rotation of click shuttle is checked.In the following grid check and anode check, if the part that lights up is shifted as the click shuttle rotates, the function is normal.

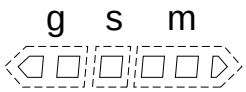
6. Display of Fluorescent Display Tube

Use this mode when checking the FL display tube precisely, though the FL display tube is roughly checked in the auto display mode. Press simultaneously the STOP and PLAY buttons on the set, so that the FL display tube can all be lighted up.





(2G~8G)



(Grid)

(Anode)

	1G	2G	3G	4G	5G	6G	7G	8G
P1	ANGLE	a	a	a	a	a	a	a
P2	DTS	h	h	h	h	h	h	h
P3	PBC	j	j	j	j	j	j	j
P4	NTSC	k	k	k	k	k	k	k
P5		b	b	b	b	b	b	b
P6		f	f	f	f	f	f	f
P7		m	m	m	m	m	m	m
P8		s	s	s	s	s	s	s
P9		g	g	g	g	g	g	g
P10		c	c	c	c	c	c	c
P11		e	e	e	e	e	e	e
P12		n	n	n	n	n	n	n
P13		p	p	p	p	p	p	p
P14		r	r	r	r	r	r	r
P15		d	d	d	d	d	d	d
P16		Dp	Dp	Dp	Dp	Dp	Dp	
P17		A-	TRACK	HOUR	TITLE	MIN	CHAP	SEC
P18		B						

7. Grid Check (↑ button: Grid Check Mode)

In this mode, arbitrary one grid of FL display tube lights up. (The anodes of the grid concerned all light up.) To shift the grids, use the click shuttle on the set. For the models not having the click shuttle, the DVD Remocon having the click shuttle can be used instead.

During this mode, any one grid always lights up.

8. Anode Check (→ button: Anode Check Mode)

In this mode, arbitrary one anode of FL display tube lights up. (All grids of the anode concerned all light up.)
Staring from P1, rotate the click shuttle clockwise, and the anodes shift such as P2, P3 .... The anodes return to P1 following the last anode. During this mode, one anode of all grids always lights up. For the models not having the click shuttle, the DVD Remocon having the click shuttle can be used instead.

9. LED Control

In this mode, LEDs, one by one, light up by pressing the ↓ button. The “CD”, “VIDEO CD” and “DVD” LEDs on the set can be controlled with the STOP button.
Each time the STOP button is pressed, CD → VIDEO CD → DVD → CD, VIDEO CD, DVD light up → CD, VIDEO CD, DVD go off are repeated.

5. TROUBLESHOOTING

1. Test Mode is not activated

With the set assembled in the front panel, the Test mode does not become active if any button was pressed by any reason.Under this condition, the power is not turned on even in the normal status. (The set is kept in Standby status = Red LED is kept on) Not only the buttons are inactive, but also a signal from Remocon is not accepted. To check this condition, with the self check port (pin ⑥⑨ of IF CON) kept in “Low” status, supply the AC power, so that the Test mode is forcibly activated. On the board, short the lands where SELF is printed. The IF CON checks the self check port only after the power on reset (only when AC is supplied; not in Standby status). If any button was pressed, the button name should be displayed on the FL display tube. Though no button is pressed this time, display of other than NOTHING implies that the button was pressed. However, the set will go in Standby status immediately unless the FFC (pin ⑰) connected to the MB-85 board is disconnected in advance.

2. Power is not turned on

① Red (STANDBY) LED does not light up when AC was supplied. The power (EVER 5 V) is not supplied.
X201 is oscillating.
Loose connection of the connector between FL board and FR board.

② Red (STANDBY) LED is kept on though POWER button was pressed. Any button is kept pressed.
PCHECK (IF CON pin ⑦⑦) is over 0.1 V.

③ Green LED lights up when POWER button was pressed, but red LED lights up again after several seconds. PCHECK (IF CON pin ⑦⑦) is abnormal. (Slow rise time from 0.1 V to 1.5 V. Voltage must be less than 1.5 V)
SYSTEM CONTROL does not operate normally.

SECTION 7
ELECTRICAL ADJUSTMENT

In making adjustment, refer to 7-3. Adjustment Related Parts Arrangement.

Note: During diagnostic check, the characters and color bars can be seen only with the NTSC monitor. Therefore, for diagnostic check, use the monitor that supports both NTSC and PAL modes.
Use the reference disc for PAL for check, and use the reference disc for NTSC for adjustment.

This section describes procedures and instructions necessary for adjusting electrical circuits in this set.

Instruments required:

1) Color monitor TV
2) Oscilloscope 1 or 2 phenomena, band width over 100 MHz, with delay mode
3) Frequency counter (over 8 digits)
4) Digital voltmeter
5) Standard commander (RMT-D109E/D109O)
6) DVD reference disc
   HLX-501 (J-6090-071-A) (dual layer) (NTSC)
   HLX-503 (J-6090-069-A) (single layer) (NTSC)
   HLX-504 (J-6090-088-A) (single layer) (NTSC)
   HLX-505 (J-6090-089-A) (dual layer) (NTSC)
   HLX-506 (J-6090-077-A) (single layer) (PAL)
   HLX-507 (J-6090-078-A)(dual layer) (PAL)
7) SACD reference disc
   HLXA-509 (J-6090-090-A)

7-1. POWER SUPPLY ADJUSTMENT

1. MPD0102 Board

Mode	E-E
Instrument	Digital voltmeter
+5 V Check	
Test point	CN201 pin ⑤
Specification	5.0 ± 0.2 Vdc
+3.3 V Check	
Test point	CN201 pin ⑦
Specification	3.3 ± 0.2 Vdc
EVER+5 V Check	
Test point	CN203 pin ②
Specification	5.0 ± 0.2 Vdc
P_CONT Check	
Test point	CN203 pin ①
Specification	4V – 5 Vdc
+10 V Check	
Test point	CN201 pin ①
Specification	$9.5^{+1.5}_{-0.5}$ Vdc
–10 V Check	
Test point	CN203 pin ④
Specification	–10.0 ± 1.0 Vdc

Checking method:

1) Confirm that each voltage satisfies the specification.

7-2. ADJUSTMENT OF VIDEO SYSTEM

1. Video Level Adjustment (MB-85 BOARD)

<Purpose>

This adjustment is made to satisfy the NTSC standard, and if not adjusted correctly, the brightness will be too large or small.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	LINE OUT (VIDEO) connector (75 Ω terminated)
Instrument	Oscilloscope
Adjusting element	RV401
Specification	1.0 ± 0.02 Vp-p

Adjusting method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Adjust the RV401 to attain 1.0 ± 0.02 Vp-p.

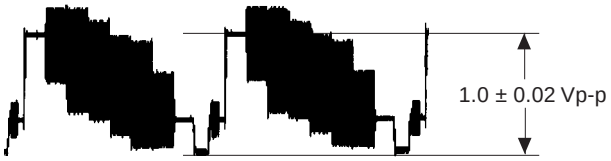


Figure 7-1

2. S-terminal Output Check (MB-85 BOARD)

<Purpose>

Check S-terminal video output. If it is incorrect, pictures will not be displayed correctly in spite of connection to the TV with a S-terminal cable.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-Y) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	1.0 ± 0.1 Vp-p

Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-Y level is 1.0 ± 0.1 Vp-p.

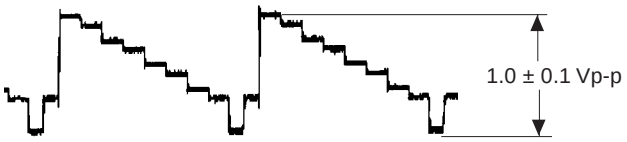


Figure 7-2

3. Checking S Video Output S-C (MB-85 BOARD)

<Purpose>

This checks whether the S-C satisfies the NTSC Standard. If it is not correct, the colors will be too dark or light.

Mode	Video level adjustment in test mode
Signal	Color bars
Test point	S VIDEO OUT (S-C) connector (75 Ω terminated)
Instrument	Oscilloscope
Specification	286 ± 50 mVp-p (NTSC) 300 ± 100 mVp-p (PAL)

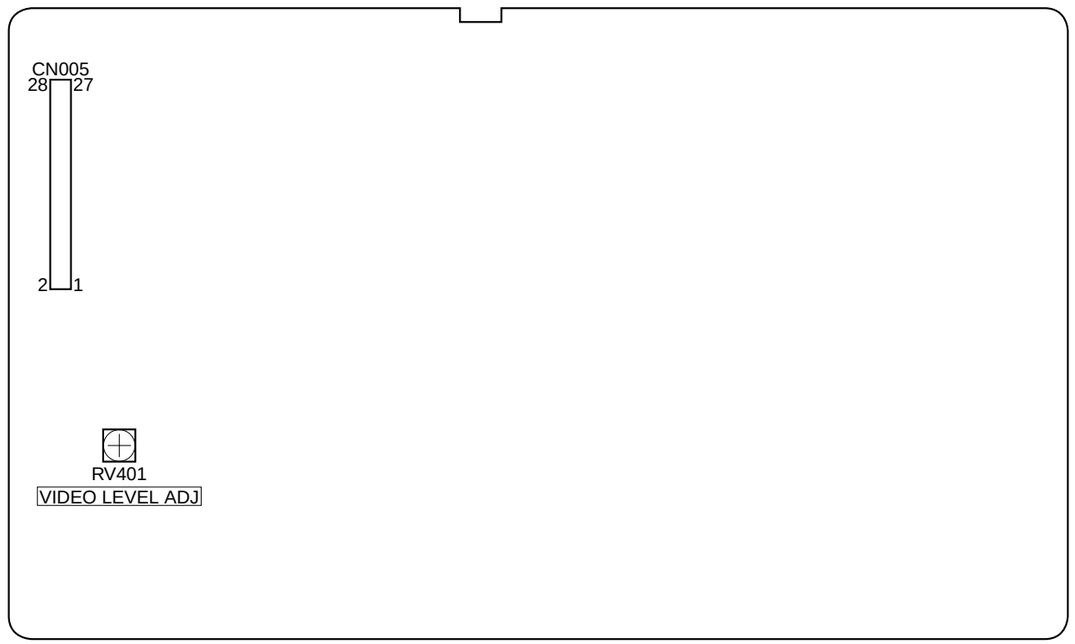
Checking method:

1) In the test mode initial menu “6” Video Level Adjustment, set so that color bars are generated.
2) Confirm that the S-C burst is 300 ± 100 mVp-p.

Figure 7-3

7-3. ADJUSTMENT RELATED PARTS ARRANGEMENT

MB-85 BOARD (SIDE A)



MPD0102 BOARD (SIDE A)

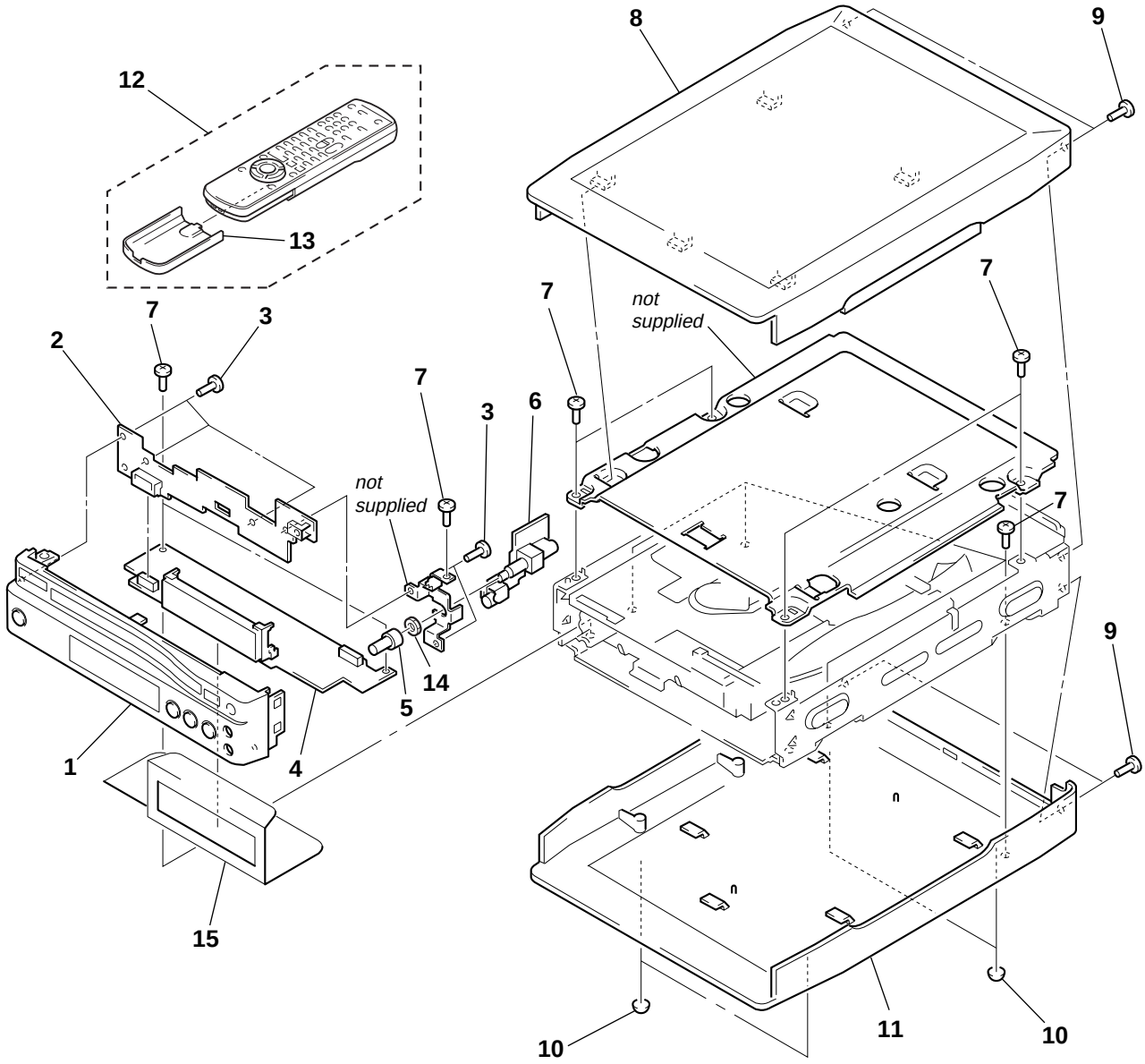
SECTION 8
REPAIR PARTS LIST

8-1. EXPLODED VIEWS

NOTE:
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Abbreviation
  AUS : Australian model
  HK : Hong Kong model
  SP : Singapore model
- The mechanical parts with no reference number in the exploded views are not supplied.
- Accessories and packing materials are given in the last of the electrical parts list.

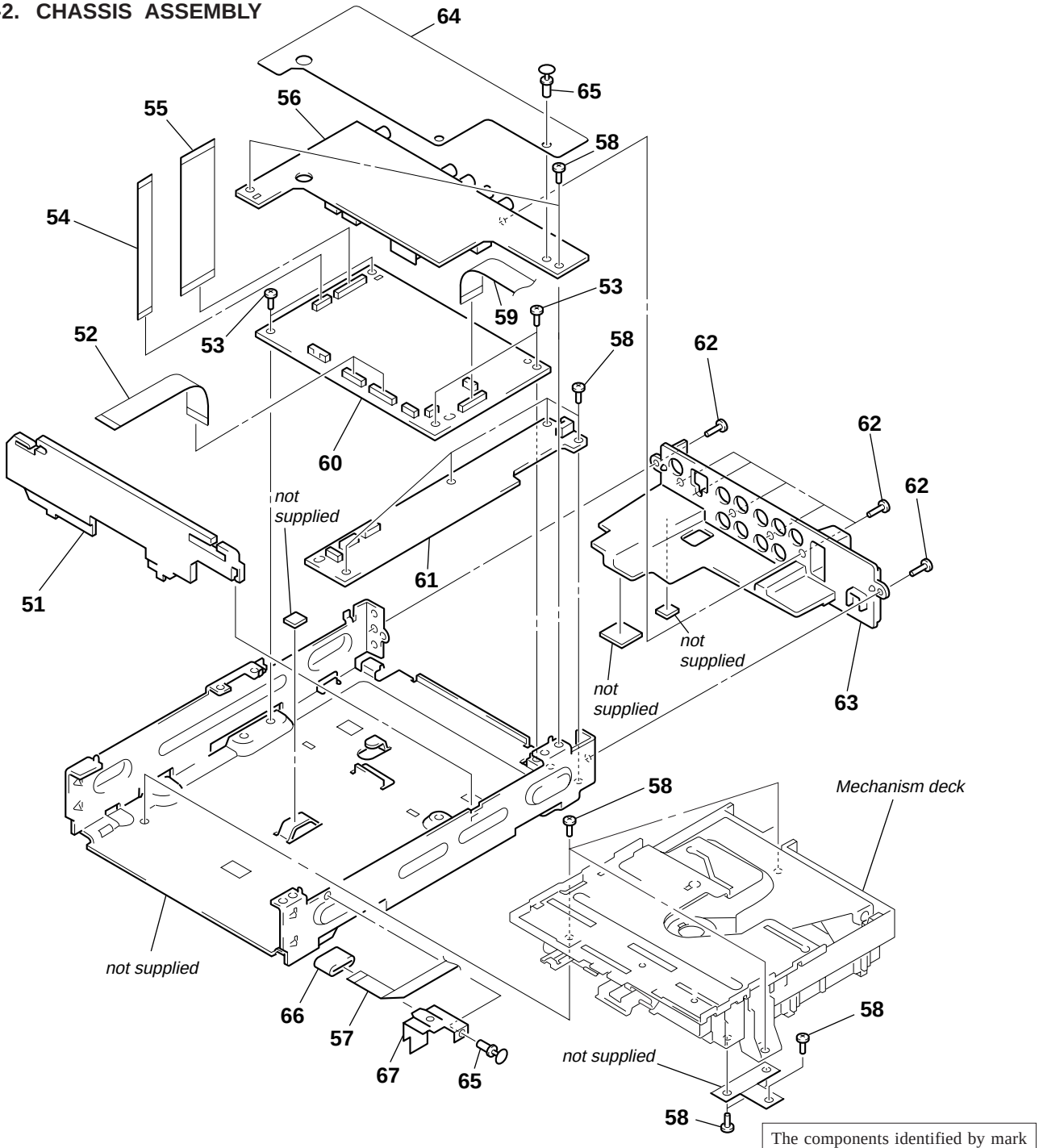
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

8-1-1. CASE AND FRONT PANEL ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3949-958-1	PANEL ASSY, FRONT	
* 2	A-6065-378-A	FR-166 BOARD, COMPLETE	
3	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	
* 4	A-6065-377-A	FL-111 BOARD, COMPLETE	
5	3-057-522-01	KNOB, HP VOLUME	
* 6	A-6065-379-A	HP-122 BOARD, COMPLETE	
7	3-970-608-01	SUMITITE (B3), +BV	
8	3-057-500-01	CASE (UPPER) (EXCEPT HK, SP)	
8	3-057-500-11	CASE (UPPER) (HK, SP)	
9	3-970-608-51	SUMITITE (B3), +BV	
10	3-740-607-01	CUSHION	
11	3-057-501-01	CASE (LOWER)	
12	1-418-508-21	COMMANDER, STANDARD (RMT-D109O/S) (EXCEPT HK, SP)	
12	1-418-508-31	COMMANDER, STANDARD (RMT-D109E/S) (HK, SP)	
13	3-053-633-01	COVER, BATTERY (for RMT-D109O/S, D109E/S)	
14	3-950-989-01	NUT (M7), HEXAGON	
15	X-3950-213-1	FILM ASSY, SHILD	

8-1-2. CHASSIS ASSEMBLY

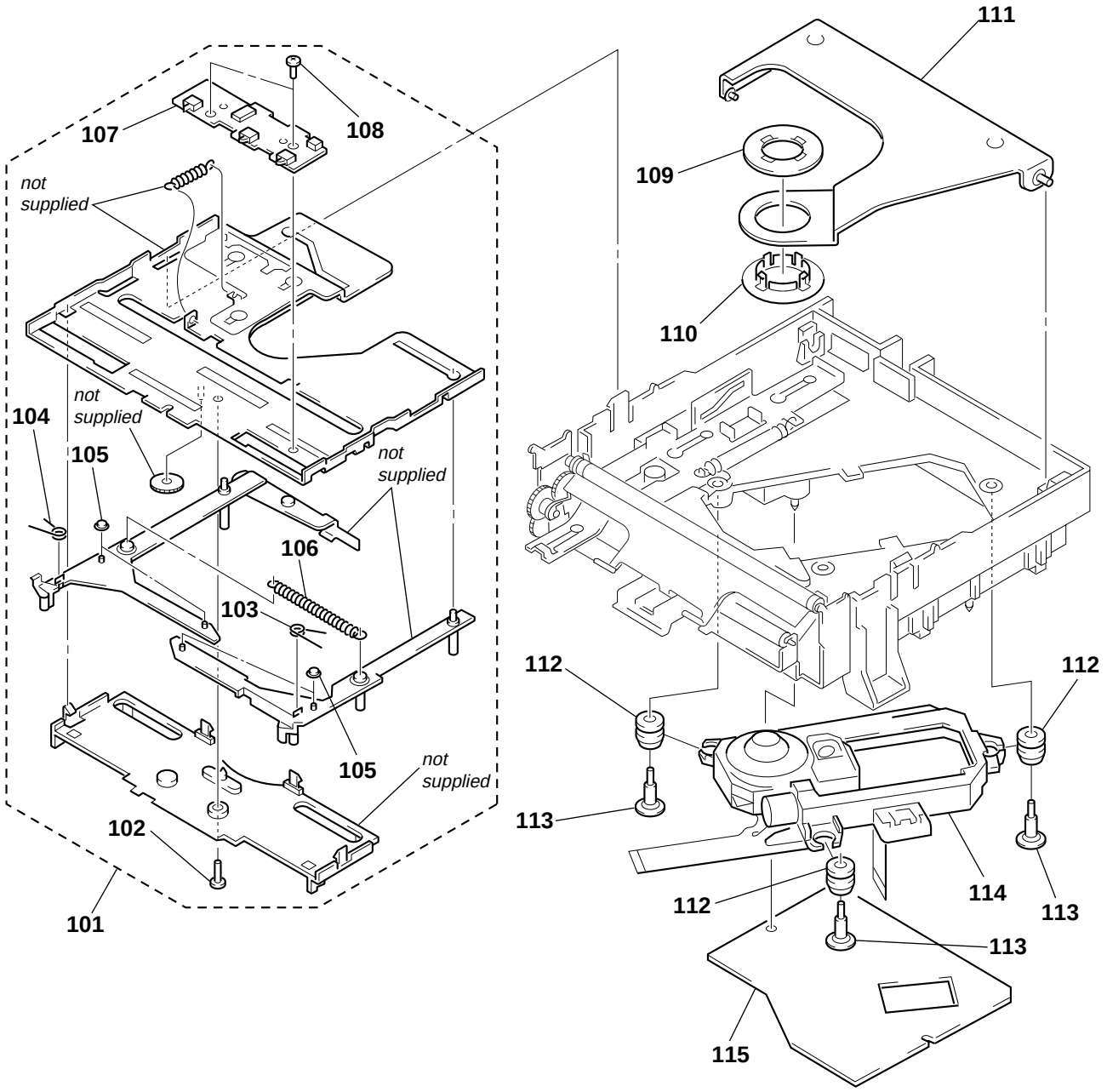


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	3-057-505-01	PLATE, HEAT INSULATING	
52	1-791-670-11	CABLE, FLEXIBLE FLAT (FMT-27)	
53	3-055-791-01	SUMITITE (B3) (RING), +BV	
54	1-791-668-11	CABLE, FLEXIBLE FLAT (FMA-17)	
55	1-791-669-11	CABLE, FLEXIBLE FLAT (FMA-18)	
* 56	A-6065-376-A	AU-222 BOARD, COMPLETE (EXCEPT HK, SP, AUS)	
* 56	A-6065-383-A	AU-222 BOARD, COMPLETE (HK, SP, AUS)	
57	1-791-672-11	CABLE, FLEXIBLE FLAT (FMS-12)	
58	3-970-608-01	SUMITITE (B3), +BV	
59	1-791-671-11	CABLE, FLEXIBLE FLAT (FMF-38)	

Ref. No.	Part No.	Description	Remark
* 60	A-6065-375-A	MB-85 BOARD, COMPLETE (CED, UK)	
* 60	A-6065-384-A	MB-85 BOARD, COMPLETE (HK, SP)	
* 60	A-6065-385-A	MB-85 BOARD, COMPLETE (AUS)	
* 60	A-6065-390-A	MB-85 BOARD, COMPLETE (E32)	
⚠61	1-418-669-11	CONVERTER UNIT, DC-DC	
62	3-970-608-51	SUMITITE (B3), +BV	
63	3-057-504-01	PANEL, REAR	
64	3-058-362-01	COVER, AU	
65	3-531-576-01	RIVET	
66	1-543-950-11	CORE, FERRITE	
67	3-058-026-01	HOLDER (SW)	

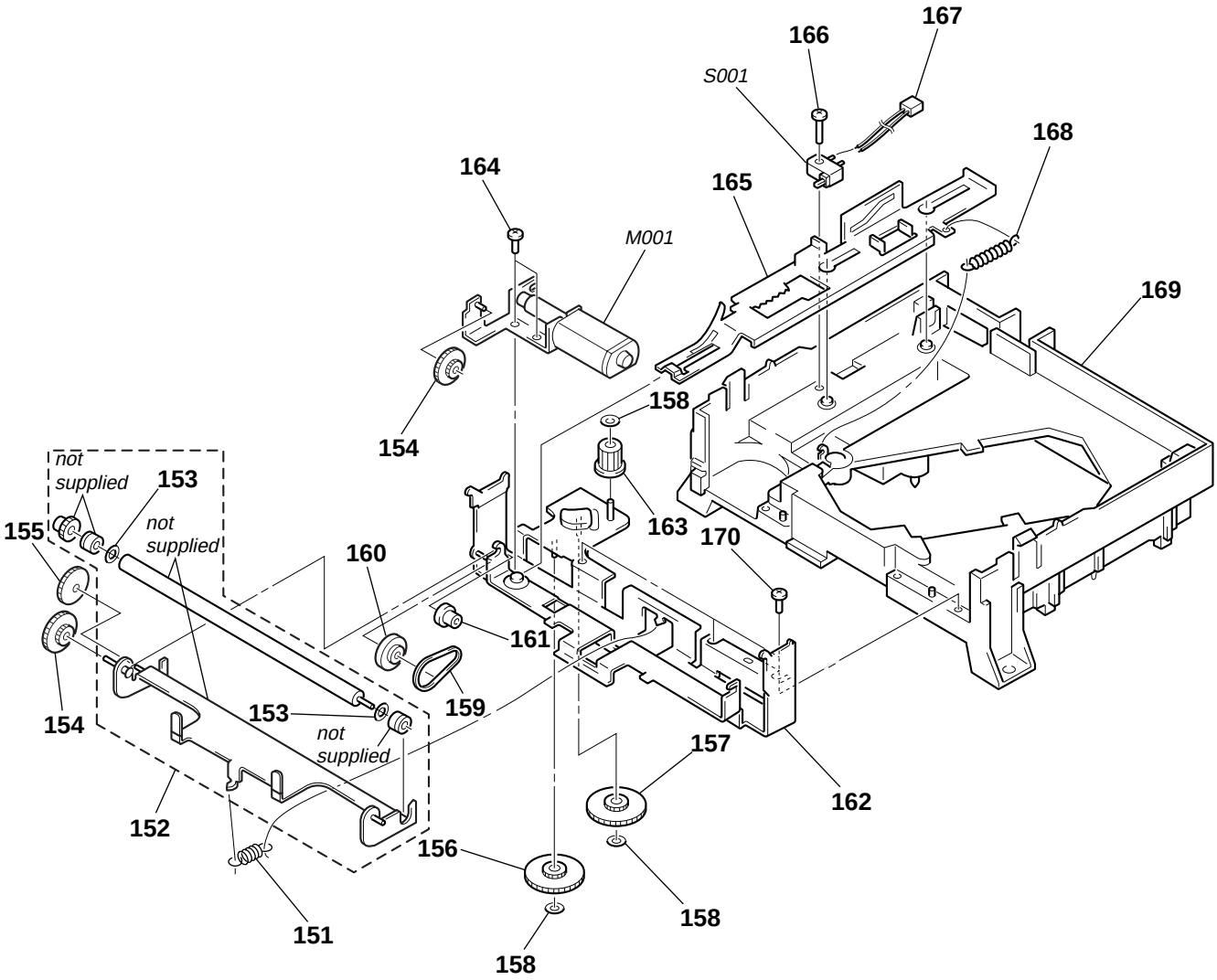
8-1-3. MECHANISM DECK ASSEMBLY-1



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
101	A-6062-251-A	CHASSIS (TOP) BLOCK ASSY	
102	4-981-286-01	SCREW (M1.7X2) (IB LOCK)	
103	4-989-134-01	SPRING (R), TORSION	
104	4-989-135-01	SPRING (L), TORSION	
105	4-989-987-01	BEARING (SLIDE)	
106	4-989-132-01	SPRING (CENTERING), TENSION	
* 107	A-6065-380-A	SW-332 BOARD, COMPLETE	
108	3-932-755-01	SCREW (M1.7X2.2)	
109	3-057-574-01	PLATE, YOKE	
110	3-057-573-01	PLATE, CHUCK	
111	X-3950-204-1	ARM ASSY, CHUCKING	
112	3-057-023-01	INSULATOR (RB)	
113	3-057-582-01	SCREW, INSULATOR	
⚠114	8-820-081-03	OPTICAL PICK-UP KHM-220AAA/J1RP	
* 115	A-6065-381-A	TK-55 BOARD, COMPLETE	

8-1-4. MECHANISM DECK ASSEMBLY-2



Ref. No.	Part No.	Description	Remark
151	4-989-170-01	SPRING (ROLLER), TENSION	
152	A-6062-261-A	ARM BLOCK ASSY, ROLLER	
153	4-991-241-01	WASHER	
154	4-989-163-01	GEAR (ROLLER A)	
155	4-989-169-03	GEAR (ROLLER B)	
156	4-989-162-01	WHEEL (LD), WORM	
157	4-989-164-02	GEAR (LD A)	
158	3-377-719-11	WASHER, POLYETHYLENE	
159	4-989-186-01	BELT, ROLLER	
160	4-989-185-02	PULLEY, ROLLER	
161	4-989-184-02	PULLEY, MOTOR	
* 162	X-3949-966-1	CHASSIS (FRONT) ASSY	
163	4-989-165-02	GEAR (LD B)	
164	3-317-552-71	SCREW (M1.7)	
165	3-057-568-01	SLIDER, CAM	
166	4-993-986-01	SCREW (2) (P TITE), (+) P TAPPING	
167	1-960-020-11	HARNESS (ST-117)	
168	4-989-188-01	SPRING (CAM SLIDER), TENSION	
169	X-3949-967-1	FRAME ASSY, MAIN	
170	7-685-133-19	SCREW (DIA. 2.6) (IT3B)	
M001	A-4608-416-A	MOTOR ASSY, LD (LOADING)	
S001	1-570-771-21	SWITCH (CHUCK SENSOR)	

8-2. ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX and -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Abbreviation
  AUS : Australian model
  HK : Hong Kong model
  SP : Singapore model
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA. . : µA. . uPA. . : µPA. .
  uPB. . : µPB. . uPC. . : µPC. .
  uPD. . : µPD. .
- CAPACITORS
  uF: µF
- COILS
  uH: µH
- Not all of the parts for DC-DC CONVERTER UNIT (MPD0102) are listed.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board.

Ref. No.	Part No.	Description			Remark
*	A-6065-376-A	AU-222 BOARD, COMPLETE (EXCEPT HK, SP, AUS)			
*	A-6065-383-A	AU-222 BOARD, COMPLETE (HK, SP, AUS)			
		********** (Ref.No. 2,000 Series)			
		< CAPACITOR >			
C301	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C302	1-163-233-11	CERAMIC CHIP	18PF	5%	50V
C304	1-126-926-11	ELECT	1000uF	20%	10V
C305	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C306	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C307	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C308	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C312	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C313	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C314	1-104-665-11	ELECT	100uF	20%	10V
C315	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C316	1-104-665-11	ELECT	100uF	20%	10V
C317	1-104-664-11	ELECT	47uF	20%	16V
C318	1-104-664-11	ELECT	47uF	20%	16V
C319	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C320	1-104-664-11	ELECT	47uF	20%	16V
C321	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C322	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C323	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C324	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C325	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C326	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C327	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C328	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C329	1-130-491-00	MYLAR	0.047uF	5%	50V
C330	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C331	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C332	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C334	1-136-170-00	MYLAR	0.27uF	5%	50V
C335	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C336	1-104-664-11	ELECT	47uF	20%	16V
C337	1-136-850-11	MYLAR	0.1uF	5%	63V
C338	1-104-664-11	ELECT	47uF	20%	16V
C339	1-104-664-11	ELECT	47uF	20%	16V
C340	1-136-850-11	MYLAR	0.1uF	5%	63V
C341	1-104-664-11	ELECT	47uF	20%	16V

Ref. No.	Part No.	Description			Remark
C342	1-104-665-11	ELECT	100uF	20%	10V
C345	1-104-665-11	ELECT	100uF	20%	10V
C346	1-104-665-11	ELECT	100uF	20%	10V
C347	1-104-665-11	ELECT	100uF	20%	10V
C348	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C350	1-126-935-11	ELECT	470uF	20%	6.3V
C351	1-126-935-11	ELECT	470uF	20%	6.3V
C352	1-104-664-11	ELECT	47uF	20%	16V
C353	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C355	1-163-259-91	CERAMIC CHIP	220PF	5%	50V
C356	1-126-960-11	ELECT	1uF	20%	50V
C357	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS)
C357	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS)
C358	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS)
C358	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS)
C359	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS)
C359	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS)
C360	1-163-133-00	CERAMIC CHIP	470PF	5%	50V (EXCEPT HK, SP, AUS)
C360	1-163-251-11	CERAMIC CHIP	100PF	5%	50V (HK, SP, AUS)
C361	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C362	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C365	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C366	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C367	1-164-346-11	CERAMIC CHIP	1uF		16V
C368	1-164-346-11	CERAMIC CHIP	1uF		16V
C369	1-164-346-11	CERAMIC CHIP	1uF		16V
C371	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C372	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C373	1-104-664-11	ELECT	47uF	20%	16V
		< CONNECTOR >			
CN301	1-785-698-11	CONNECTOR, FFC/FPC 28P			
CN302	1-785-695-11	CONNECTOR, FFC/FPC 13P			
CN303	1-573-733-11	PIN, CONNECTOR 6P			
CN306	1-506-482-11	PIN, CONNECTOR 3P			

Ref. No.	Part No.	Description	Remark
		< DIODE >	
D301	8-719-988-61	DIODE 1SS355TE-17	
D302	8-719-988-61	DIODE 1SS355TE-17	
D304	8-719-988-61	DIODE 1SS355TE-17	
D305	8-719-988-61	DIODE 1SS355TE-17	
D306	8-719-988-61	DIODE 1SS355TE-17	
D308	8-719-071-15	DIODE HZM6.8ZWA1TL	
D309	8-719-071-15	DIODE HZM6.8ZWA1TL	
D310	8-719-071-15	DIODE HZM6.8ZWA1TL	
D311	8-719-071-15	DIODE HZM6.8ZWA1TL	
		< FERRITE BEAD >	
FB301	1-414-553-11	FERRITE 0uH	
FB302	1-414-553-11	FERRITE 0uH	
FB303	1-414-553-11	FERRITE 0uH	
FB304	1-414-553-11	FERRITE 0uH	
FB305	1-414-135-11	FERRITE 0uH	
FB306	1-414-553-11	FERRITE 0uH	
FB307	1-414-553-11	FERRITE 0uH	
FB308	1-414-553-11	FERRITE 0uH	
FB309	1-414-553-11	FERRITE 0uH	
FB310	1-414-553-11	FERRITE 0uH	
FB311	1-414-553-11	FERRITE 0uH	
FB312	1-414-553-11	FERRITE 0uH	
FB313	1-414-553-11	FERRITE 0uH	
FB314	1-414-553-11	FERRITE 0uH	
FB315	1-414-553-11	FERRITE 0uH	
FB316	1-414-553-11	FERRITE 0uH	
FB317	1-414-553-11	FERRITE 0uH	
FB318	1-414-553-11	FERRITE 0uH	
FB319	1-414-553-11	FERRITE 0uH	
FB320	1-414-553-11	FERRITE 0uH	
		< IC >	
IC301	8-759-288-53	IC LA5617	
IC303	8-759-909-71	IC BA4558F-E2	
IC304	8-759-909-71	IC BA4558F-E2	
IC305	8-759-909-71	IC BA4558F-E2	
IC306	8-759-525-25	IC BU4052BCF-E2	
IC307	8-759-909-71	IC BA4558F-E2	
IC308	8-759-563-79	IC BA7660F-E2	
IC309	8-749-016-00	IC HVE0024 (OPTICAL)	
IC310	8-759-242-64	IC TC4W53F (TE12R)	
		< JACK >	
J301	1-793-446-21	JACK, PIN 1P (COAXIAL)	
J302	1-694-409-41	TERMINAL BOARD (LINE OUT)	
J303	1-793-446-11	JACK, PIN 1P (WOOFER OUT)	
		< COIL >	
L301	1-412-953-11	INDUCTOR 15uH	
L302	1-412-953-11	INDUCTOR 15uH	
L303	1-412-953-11	INDUCTOR 15uH	
L304	1-412-963-11	INDUCTOR 100uH	
		< TRANSISTOR >	
Q301	8-729-421-19	TRANSISTOR UN2213-TX	
Q302	8-729-216-22	TRANSISTOR 2SB709A-QRS-TX	
Q303	8-729-421-19	TRANSISTOR UN2213-TX	
Q304	8-729-424-08	TRANSISTOR UN2111-TX	
Q305	8-729-424-08	TRANSISTOR UN2111-TX	
Q306	8-729-424-08	TRANSISTOR UN2111-TX	
Q307	8-729-424-08	TRANSISTOR UN2111-TX	
Q311	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q314	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q317	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q318	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q319	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q320	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q321	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q322	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	
Q323	8-729-421-19	TRANSISTOR UN2213-TX	
Q324	8-729-424-08	TRANSISTOR UN2111-TX	
Q325	8-729-120-28	TRANSISTOR 2SC2412K-T-146-QR	
Q326	8-729-421-19	TRANSISTOR UN2213-TX	
Q327	8-729-421-19	TRANSISTOR UN2213-TX	
Q330	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS)
Q331	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS)
Q332	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS)
Q333	8-729-046-97	TRANSISTOR 2SD1938 (F)-T (TX).SO	(EXCEPT HK, SP, AUS)
		< RESISTOR >	
R302	1-216-042-00	METAL CHIP 510 5% 1/10W	
R303	1-216-042-00	METAL CHIP 510 5% 1/10W	
R304	1-216-042-00	METAL CHIP 510 5% 1/10W	
R307	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R310	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R312	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R313	1-216-109-00	METAL CHIP 330K 5% 1/10W	
R318	1-216-049-91	RES, CHIP 1K 5% 1/10W	
R319	1-216-097-91	RES, CHIP 100K 5% 1/10W	
R321	1-216-097-91	RES, CHIP 100K 5% 1/10W	
R324	1-216-097-91	RES, CHIP 100K 5% 1/10W	
R325	1-216-097-91	RES, CHIP 100K 5% 1/10W	
R326	1-216-097-91	RES, CHIP 100K 5% 1/10W	
R328	1-216-089-91	RES, CHIP 47K 5% 1/10W	
R329	1-216-089-91	RES, CHIP 47K 5% 1/10W	
R331	1-216-089-91	RES, CHIP 47K 5% 1/10W	
R332	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R333	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R334	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R335	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R336	1-216-077-91	RES, CHIP 15K 5% 1/10W	
R337	1-216-077-91	RES, CHIP 15K 5% 1/10W	
R338	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R339	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R340	1-216-071-00	METAL CHIP 8.2K 5% 1/10W	
R341	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R342	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R343	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R344	1-216-295-91	SHORT 0	
R346	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R347	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R348	1-216-069-00	METAL CHIP 6.8K 5% 1/10W	
R349	1-216-295-91	SHORT 0	
R350	1-216-009-91	RES, CHIP 22 5% 1/10W	
R351	1-216-009-91	RES, CHIP 22 5% 1/10W	

Ref. No.	Part No.	Description			Remark
R352	1-216-009-91	RES, CHIP	22	5%	1/10W
R353	1-216-041-00	METAL CHIP	470	5%	1/10W
R354	1-216-295-91	SHORT	0		
R355	1-216-295-91	SHORT	0		
R356	1-216-115-00	METAL CHIP	560K	5%	1/10W
R357	1-216-115-00	METAL CHIP	560K	5%	1/10W
R358	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R359	1-216-047-91	RES, CHIP	820	5%	1/10W
R360	1-216-095-00	METAL CHIP	82K	5%	1/10W
R362	1-216-047-91	RES, CHIP	820	5%	1/10W
R366	1-216-049-91	RES, CHIP	1K	5%	1/10W
R367	1-216-049-91	RES, CHIP	1K	5%	1/10W
R370	1-216-109-00	METAL CHIP	330K	5%	1/10W
R371	1-216-109-00	METAL CHIP	330K	5%	1/10W
R372	1-216-109-00	METAL CHIP	330K	5%	1/10W
R373	1-216-073-00	METAL CHIP	10K	5%	1/10W
R374	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R375	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R376	1-216-075-00	METAL CHIP	12K	5%	1/10W
R378	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R379	1-216-041-00	METAL CHIP	470	5%	1/10W
R380	1-216-075-00	METAL CHIP	12K	5%	1/10W
R381	1-216-073-00	METAL CHIP	10K	5%	1/10W
R382	1-216-041-00	METAL CHIP	470	5%	1/10W
R383	1-216-041-00	METAL CHIP	470	5%	1/10W
R384	1-216-067-00	METAL CHIP	5.6K	5%	1/10W
R387	1-216-049-91	RES, CHIP	1K	5%	1/10W
R388	1-216-049-91	RES, CHIP	1K	5%	1/10W
R390	1-216-049-91	RES, CHIP	1K	5%	1/10W
R391	1-216-049-91	RES, CHIP	1K	5%	1/10W
R392	1-216-025-91	RES, CHIP	100	5%	1/10W
R393	1-216-085-00	METAL CHIP	33K	5%	1/10W
R394	1-216-085-00	METAL CHIP	33K	5%	1/10W
R395	1-216-085-00	METAL CHIP	33K	5%	1/10W
R396	1-216-085-00	METAL CHIP	33K	5%	1/10W
R397	1-216-085-00	METAL CHIP	33K	5%	1/10W
R398	1-216-081-00	METAL CHIP	22K	5%	1/10W
R399	1-216-081-00	METAL CHIP	22K	5%	1/10W
R400	1-216-085-00	METAL CHIP	33K	5%	1/10W
R410	1-216-049-91	RES, CHIP	1K	5%	1/10W
				(EXCEPT HK, SP, AUS)	
R411	1-216-049-91	RES, CHIP	1K	5%	1/10W
				(EXCEPT HK, SP, AUS)	
R412	1-216-049-91	RES, CHIP	1K	5%	1/10W
				(EXCEPT HK, SP, AUS)	
R413	1-216-049-91	RES, CHIP	1K	5%	1/10W
				(EXCEPT HK, SP, AUS)	
R466	1-216-027-00	METAL CHIP	120	5%	1/10W
R467	1-216-027-00	METAL CHIP	120	5%	1/10W
R468	1-216-027-00	METAL CHIP	120	5%	1/10W
R469	1-216-027-00	METAL CHIP	120	5%	1/10W
R470	1-216-049-91	RES, CHIP	1K	5%	1/10W
R471	1-216-049-91	RES, CHIP	1K	5%	1/10W
R472	1-216-073-00	METAL CHIP	10K	5%	1/10W
R473	1-216-073-00	METAL CHIP	10K	5%	1/10W
R474	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R475	1-216-073-00	METAL CHIP	10K	5%	1/10W
R476	1-216-021-00	METAL CHIP	68	5%	1/10W
R477	1-216-021-00	METAL CHIP	68	5%	1/10W
R478	1-216-021-00	METAL CHIP	68	5%	1/10W
R479	1-216-021-00	METAL CHIP	68	5%	1/10W
R480	1-216-021-00	METAL CHIP	68	5%	1/10W
R481	1-216-021-00	METAL CHIP	68	5%	1/10W
R482	1-216-063-91	RES, CHIP	3.9K	5%	1/10W
R483	1-216-055-00	METAL CHIP	1.8K	5%	1/10W
R484	1-216-033-00	METAL CHIP	220	5%	1/10W
R485	1-216-021-00	METAL CHIP	68	5%	1/10W
R486	1-216-041-00	METAL CHIP	470	5%	1/10W
R487	1-216-041-00	METAL CHIP	470	5%	1/10W
R488	1-216-041-00	METAL CHIP	470	5%	1/10W
R489	1-216-041-00	METAL CHIP	470	5%	1/10W
R490	1-216-295-91	SHORT	0		
R491	1-216-025-91	RES, CHIP	100	5%	1/10W
R492	1-216-097-91	RES, CHIP	100K	5%	1/10W
R495	1-216-073-00	METAL CHIP	10K	5%	1/10W
R496	1-216-073-00	METAL CHIP	10K	5%	1/10W
R497	1-216-057-00	METAL CHIP	2.2K	5%	1/10W

⚠	1-418-669-11	DC-DC CONVERTER UNIT (MPD0102)			
		**********			
		(Ref.No. 6,000 Series)			
		< DIODE >			
D201	9-884-690-01	DIODE ERB83-006			
D221	9-884-691-01	DIODE 1SS133			
D251	9-884-690-01	DIODE ERB83-006			
D261	9-884-692-01	DIODE 2FWJ42N			
D262	9-884-693-01	DIODE HZS12			
D272	9-884-694-01	DIODE HZ22			
D292	9-884-695-01	DIODE ERA15-006			
		< IC >			
IC251	9-884-696-01	IC PQ05RD11			
IC271	9-884-697-01	IC TA76431S			
IC281	9-884-698-01	IC uPC78L05			
		< TRANSISTOR >			
Q201	9-884-699-01	TRANSISTOR	2SK2232		
Q202	9-884-700-01	TRANSISTOR	2SC1741AS		
Q221	9-884-701-01	TRANSISTOR	2SC1740S		
Q261	9-884-702-01	TRANSISTOR	2SA933S		
Q291	9-884-703-01	TRANSISTOR	2SJ378		
Q292	9-884-701-01	TRANSISTOR	2SC1740S		
Q293	9-884-701-01	TRANSISTOR	2SC1740S		
Q294	9-884-701-01	TRANSISTOR	2SC1740S		
		< RESISTOR >			
R265	9-884-704-01	CARBON	3.3K	0.5%	1/4W
R266	9-884-706-01	CARBON	10K	0.5%	1/4W
R281	9-884-705-01	CARBON	22		2W
		< TRANSFORMER >			
T201	9-884-707-01	TRANSFORMER			

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

FL-111

Ref. No.	Part No.	Description			Remark
*	A-6065-377-A	FL-111 BOARD, COMPLETE			
		**********			
					(Ref.No. 2,000 Series)
	3-057-521-01	HOLDER, FL			
		< CAPACITOR >			
C601	1-126-395-11	ELECT	22uF	20%	16V
C603	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C605	1-126-400-11	ELECT	22uF	20%	35V
C606	1-126-603-11	ELECT CHIP	4.7uF	20%	35V
C608	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C609	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C610	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C611	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C612	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C614	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C615	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C617	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C619	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C620	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C622	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C623	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C624	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C625	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C626	1-163-001-11	CERAMIC CHIP	220PF	10%	50V
C630	1-131-746-11	CERAMIC CHIP	0.0027uF	5%	100V
		< CONNECTOR >			
CN602	1-774-767-11	CONNECTOR, FFC/FPC 15P			
CN603	1-793-658-11	CONNECTOR BOARD TO BOARD 12P			
CN604	1-784-650-21	CONNECTOR 2P			
		< DIODE >			
D601	8-719-041-97	DIODE MA113- (TX)			
D602	8-719-041-97	DIODE MA113- (TX)			
D603	8-719-041-97	DIODE MA113- (TX)			
D604	8-719-041-97	DIODE MA113- (TX)			
D606	8-719-421-85	DIODE MA8043-H (TX)			
D607	8-719-988-61	DIODE 1SS355TE-17			
		< FERRITE BEAD >			
FB601	1-414-135-11	FERRITE	0uH		
FB602	1-414-135-11	FERRITE	0uH		
FB603	1-469-324-21	FERRITE	0uH		
		< IC >			
IC601	8-759-599-87	IC M38B57MCH-E227FP			
IC602	8-759-326-78	IC PST9140NL			
		< COIL >			
L601	1-412-031-11	INDUCTOR CHIP 47uH			
		< FLUORESCENT INDICATOR >			
ND601	1-517-918-11	INDICATOR TUBE, FLUORESCENT			
		< TRANSISTOR >			
Q604	8-729-808-01	TRANSISTOR	2SD1622-S-TD		
Q605	8-729-808-01	TRANSISTOR	2SD1622-S-TD		

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R603	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R604	1-216-073-00	METAL CHIP	10K	5%	1/10W
R606	1-216-073-00	METAL CHIP	10K	5%	1/10W
R607	1-216-073-00	METAL CHIP	10K	5%	1/10W
R610	1-216-027-00	RES, CHIP	120	5%	1/10W
R611	1-216-013-00	RES, CHIP	33	5%	1/10W
R612	1-216-073-00	METAL CHIP	10K	5%	1/10W
R613	1-216-073-00	METAL CHIP	10K	5%	1/10W
R614	1-216-073-00	METAL CHIP	10K	5%	1/10W
R615	1-216-073-00	METAL CHIP	10K	5%	1/10W
R616	1-216-073-00	METAL CHIP	10K	5%	1/10W
R617	1-216-025-91	RES, CHIP	100	5%	1/10W
R618	1-216-025-91	RES, CHIP	100	5%	1/10W
R619	1-216-025-91	RES, CHIP	100	5%	1/10W
R620	1-216-025-91	RES, CHIP	100	5%	1/10W
R621	1-216-025-91	RES, CHIP	100	5%	1/10W
R626	1-216-073-00	METAL CHIP	10K	5%	1/10W
R627	1-216-073-00	METAL CHIP	10K	5%	1/10W
R628	1-216-025-91	RES, CHIP	100	5%	1/10W
R629	1-216-049-91	RES, CHIP	1K	5%	1/10W
R630	1-216-025-91	RES, CHIP	100	5%	1/10W
R631	1-216-073-00	METAL CHIP	10K	5%	1/10W
R633	1-216-073-00	METAL CHIP	10K	5%	1/10W
R634	1-216-073-00	METAL CHIP	10K	5%	1/10W
R635	1-216-073-00	METAL CHIP	10K	5%	1/10W
R636	1-216-073-00	METAL CHIP	10K	5%	1/10W
R637	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R638	1-216-025-91	RES, CHIP	100	5%	1/10W
R639	1-216-097-91	RES, CHIP	100K	5%	1/10W
R640	1-216-073-00	METAL CHIP	10K	5%	1/10W
R641	1-216-073-00	METAL CHIP	10K	5%	1/10W
R642	1-216-073-00	METAL CHIP	10K	5%	1/10W
R643	1-216-073-00	METAL CHIP	10K	5%	1/10W
R645	1-216-073-00	METAL CHIP	10K	5%	1/10W
R646	1-216-073-00	METAL CHIP	10K	5%	1/10W
R647	1-216-073-00	METAL CHIP	10K	5%	1/10W
R648	1-216-025-91	RES, CHIP	100	5%	1/10W
R650	1-216-073-00	METAL CHIP	10K	5%	1/10W
R651	1-216-073-00	METAL CHIP	10K	5%	1/10W
R652	1-216-073-00	METAL CHIP	10K	5%	1/10W
R653	1-216-093-91	RES, CHIP	68K	5%	1/10W (CED)
R654	1-216-093-91	RES, CHIP	68K	5%	1/10W (CED)
R655	1-216-073-00	METAL CHIP	10K	5%	1/10W
R659	1-216-053-00	RES, CHIP	1.5K	5%	1/10W
R660	1-216-073-00	METAL CHIP	10K	5%	1/10W
R661	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R662	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R663	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R664	1-216-073-00	METAL CHIP	10K	5%	1/10W (CED)
R665	1-216-025-91	RES, CHIP	100	5%	1/10W
R666	1-216-025-91	RES, CHIP	100	5%	1/10W
R667	1-216-025-91	RES, CHIP	100	5%	1/10W
R668	1-216-025-91	RES, CHIP	100	5%	1/10W
R669	1-216-025-91	RES, CHIP	100	5%	1/10W

Ref. No.	Part No.	Description			Remark
R670	1-216-025-91	RES, CHIP	100	5%	1/10W
R671	1-216-025-91	RES, CHIP	100	5%	1/10W
R672	1-216-025-91	RES, CHIP	100	5%	1/10W
R673	1-216-025-91	RES, CHIP	100	5%	1/10W
R675	1-216-295-91	SHORT	0		
		< TRANSFORMER >			
T601	1-435-159-11	TRANSFORMER, DC-DC CONVERTER			
		< VIBRATOR >			
X601	1-767-359-11	VIBRATOR, CERAMIC (4MHz)			
*	A-6065-378-A	FR-166 BOARD, COMPLETE			
		**********			
		(Ref.No. 2,000 Series)			
		< CAPACITOR >			
C701	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C702	1-131-651-21	TANTALUM CHIP	10uF	20%	16V
		< CONNECTOR >			
CN701	1-784-987-11	CONNECTOR 12P			
		< DIODE >			
D701	8-719-064-11	DIODE SPR-325MVW (ON/STANDBY)			
D702	8-719-056-06	DIODE SLR-342DCT31 (DVD)			
D703	8-719-056-06	DIODE SLR-342DCT31 (VIDEO CD)			
D704	8-719-056-06	DIODE SLR-342DCT31 (CD)			
D705	8-719-056-06	DIODE SLR-342DCT31 (▯▯)			
D706	8-719-056-07	DIODE SLR-342MCT31 (▷)			
		< IC >			
IC701	8-749-011-22	IC GP1U27X			
		< COIL >			
L701	1-412-030-11	INDUCTOR CHIP	22uH		
		< RESISTOR >			
R701	1-216-073-00	METAL CHIP	10K	5%	1/10W
R702	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R703	1-216-065-91	RES, CHIP	4.7K	5%	1/10W
R704	1-216-075-00	METAL CHIP	12K	5%	1/10W
R705	1-216-089-91	RES, CHIP	47K	5%	1/10W
R706	1-216-025-91	RES, CHIP	100	5%	1/10W
R708	1-216-045-00	METAL CHIP	680	5%	1/10W
R709	1-216-033-00	METAL CHIP	220	5%	1/10W
R710	1-216-033-00	METAL CHIP	220	5%	1/10W
R711	1-216-033-00	METAL CHIP	220	5%	1/10W
R712	1-216-033-00	METAL CHIP	220	5%	1/10W
R713	1-216-033-00	METAL CHIP	220	5%	1/10W
R714	1-216-025-91	RES, CHIP	100	5%	1/10W
		< SWITCH >			
S701	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (I/⏻)			
S702	1-771-349-21	SWITCH, KEY BOARD (⏏)			
S703	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (▷)			
S704	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (□)			
S705	1-572-483-11	SWITCH, KEY BOARD (1 KEY) (▯▯)			
*	A-6065-379-A	HP-122 BOARD, COMPLETE			
		**********			
		(Ref.No. 2,000 Series)			
	3-057-577-01	PLATE, HP GROUND			
		< CAPACITOR >			
C501	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
C502	1-164-161-11	CERAMIC CHIP	0.0022uF	10%	100V
		< CONNECTOR >			
CN501	1-506-482-11	PIN, CONNECTOR 3P			
		< DIODE >			
D501	8-719-071-15	DIODE HZM6.8ZWA1TL			
D502	8-719-071-15	DIODE HZM6.8ZWA1TL			
		< FERRITE BEAD >			
FB501	1-414-135-11	FERRITE	0uH		
FB502	1-414-135-11	FERRITE	0uH		
FB503	1-414-135-11	FERRITE	0uH		
		< JACK >			
J501	1-573-798-11	JACK, MINIATURE (DIA. 3.5) (PHONES)			
		< RESISTOR >			
R501	1-216-017-91	RES, CHIP	47	5%	1/10W
R502	1-216-017-91	RES, CHIP	47	5%	1/10W
R503	1-216-017-91	RES, CHIP	47	5%	1/10W
R504	1-216-017-91	RES, CHIP	47	5%	1/10W
		< VARIABLE RESISTOR >			
RV501	1-225-925-11	RES, VAR 500/500 (PHONES LEVEL)			
*	A-6065-375-A	MB-85 BOARD, COMPLETE (CED, UK)			
*	A-6065-384-A	MB-85 BOARD, COMPLETE (HK, SP)			
*	A-6065-385-A	MB-85 BOARD, COMPLETE (AUS)			
*	A-6065-390-A	MB-85 BOARD, COMPLETE (E32)			
		**********			
		(Ref.No. 1,000 Series)			
		< CAPACITOR >			
C001	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C002	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C003	1-126-246-11	ELECT CHIP	220uF	20%	4V
C004	1-126-204-11	ELECT CHIP	47uF	20%	16V
C005	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C007	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C008	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C010	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C011	1-125-822-11	TANTALUM	10uF	20%	10V
C012	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C013	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C015	1-126-246-11	ELECT CHIP	220uF	20%	4V
C016	1-125-822-11	TANTALUM	10uF	20%	10V
C017	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C018	1-125-822-11	TANTALUM	10uF	20%	10V

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Ref. No.	Part No.	Description			Remark
C019	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C201	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C202	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C203	1-125-822-11	TANTALUM	10uF	20%	10V
C204	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C206	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C209	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C210	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C211	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C212	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C213	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C304	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C307	1-125-822-11	TANTALUM	10uF	20%	10V
C309	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C310	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C312	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C313	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C314	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C315	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C316	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C317	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C318	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C319	1-125-822-11	TANTALUM	10uF	20%	10V
C320	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C321	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C322	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C323	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C324	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C325	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C327	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C328	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C329	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C331	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C333	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C334	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C337	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C338	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C339	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C341	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C343	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C344	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C401	1-125-822-11	TANTALUM	10uF	20%	10V
C402	1-126-209-11	ELECT CHIP	100uF	20%	4V
C403	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C404	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C405	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C408	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C410	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C411	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C413	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C414	1-125-822-11	TANTALUM	10uF	20%	10V
C415	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C416	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C418	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C420	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C422	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C425	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C426	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C428	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V

Ref. No.	Part No.	Description			Remark
C431	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C432	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C433	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C434	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C436	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C438	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C439	1-125-822-11	TANTALUM	10uF	20%	10V
C440	1-125-822-11	TANTALUM	10uF	20%	10V
C441	1-126-209-11	ELECT CHIP	100uF	20%	4V
C443	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C505	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C506	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C508	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C510	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C512	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C601	1-125-822-11	TANTALUM	10uF	20%	10V
C602	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C603	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C604	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C605	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C606	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C607	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C608	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C701	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C702	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C703	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C704	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C705	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C706	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C707	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C708	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C709	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C710	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C711	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C712	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C713	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C714	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C715	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C717	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C801	1-126-204-11	ELECT CHIP	47uF	20%	16V
C802	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C803	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C805	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C806	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C807	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C808	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C809	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C810	1-110-563-11	CERAMIC CHIP	0.068uF	10%	16V
C811	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C812	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C813	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C814	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C815	1-110-666-11	ELECT CHIP	22uF	20%	6.3V
C816	1-104-601-11	ELECT CHIP	10uF	20%	10V
C817	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C818	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C819	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C820	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C821	1-164-230-11	CERAMIC CHIP	220PF	5%	50V
C822	1-126-204-11	ELECT CHIP	47uF	20%	16V

Ref. No.	Part No.	Description			Remark
C823	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C824	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C825	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C830	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C831	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C832	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C833	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C834	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V
C835	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C836	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C837	1-115-467-11	CERAMIC CHIP	0.22uF	10%	10V
C905	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C906	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C907	1-125-822-11	TANTALUM	10uF	20%	10V
C908	1-128-391-11	ELECT CHIP	330uF	20%	6.3V
C909	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C910	1-125-822-11	TANTALUM	10uF	20%	10V
C911	1-163-021-91	CERAMIC CHIP	0.01uF	10%	50V
C923	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C928	1-128-391-11	ELECT CHIP	330uF	20%	6.3V
C933	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C934	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C935	1-125-822-11	TANTALUM	10uF	20%	10V
C937	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C939	1-107-826-91	CERAMIC CHIP	0.1uF	10%	16V
C940	1-125-822-11	TANTALUM	10uF	20%	10V
		< CONNECTOR >			
CN001	1-785-728-21	PIN (PC BOARD), CONNECTOR 7P			
CN002	1-779-936-11	CONNECTOR, FFC/FPC 18P			
CN003	1-779-936-11	CONNECTOR, FFC/FPC 18P			
CN005	1-784-327-11	CONNECTOR, FFC/FPC 28P			
CN006	1-774-767-11	CONNECTOR, FFC/FPC 15P			
CN007	1-778-274-11	CONNECTOR, FFC/FPC 13P			
* CN009	1-778-283-11	CONNECTOR, FFC/FPC 4P			
CN010	1-573-806-21	PIN, CONNECTOR (1.5mm) (SMD) 6P			
CN011	1-573-806-21	PIN, CONNECTOR (1.5mm) (SMD) 6P			
* CN012	1-573-768-21	PIN, CONNECTOR (1.5mm) (SMD) 5P			
		< DIODE >			
D701	8-719-988-61	DIODE 1SS355TE-17			
D801	8-719-941-09	DIODE DAP202UT106			
D802	8-719-988-61	DIODE 1SS355TE-17			
D803	8-719-941-09	DIODE DAP202UT106			
D804	8-719-941-86	DIODE DAN202UT106			
D805	8-719-941-86	DIODE DAN202UT106			
D806	8-719-988-61	DIODE 1SS355TE-17			
D807	8-719-988-61	DIODE 1SS355TE-17			
		< FERRITE BEAD >			
FB001	1-469-324-21	FERRITE	0uH		
FB002	1-469-324-21	FERRITE	0uH		
FB003	1-469-324-21	FERRITE	0uH		
FB004	1-469-324-21	FERRITE	0uH		
FB005	1-469-324-21	FERRITE	0uH		
FB006	1-469-324-21	FERRITE	0uH		
FB007	1-469-324-21	FERRITE	0uH		
FB008	1-469-324-21	FERRITE	0uH		
FB014	1-469-116-21	FERRITE	0uH		
FB015	1-469-116-21	FERRITE	0uH		

Ref. No.	Part No.	Description			Remark
FB016	1-216-801-11	METAL CHIP	22	5%	1/16W
FB017	1-469-116-21	FERRITE	0uH		
FB018	1-469-116-21	FERRITE	0uH		
FB019	1-469-116-21	FERRITE	0uH		
FB020	1-469-116-21	FERRITE	0uH		
FB021	1-469-116-21	FERRITE	0uH		
FB022	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB024	1-469-116-21	FERRITE	0uH		
FB026	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB028	1-469-116-21	FERRITE	0uH		
FB029	1-469-324-21	FERRITE	0uH		
FB030	1-469-116-21	FERRITE	0uH		
FB031	1-469-116-21	FERRITE	0uH		
FB032	1-469-116-21	FERRITE	0uH		
FB033	1-469-116-21	FERRITE	0uH		
FB035	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB037	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB040	1-469-116-21	FERRITE	0uH		
FB043	1-500-283-11	INDUCTOR CHIP	0uH		
FB047	1-469-116-21	FERRITE	0uH		
FB049	1-469-116-21	FERRITE	0uH		
FB051	1-469-116-21	FERRITE	0uH		
FB053	1-500-283-11	INDUCTOR CHIP	0uH		
FB054	1-500-283-11	INDUCTOR CHIP	0uH		
FB055	1-500-283-11	INDUCTOR CHIP	0uH		
FB056	1-500-283-11	INDUCTOR CHIP	0uH		
FB058	1-500-283-11	INDUCTOR CHIP	0uH		
FB060	1-500-283-11	INDUCTOR CHIP	0uH		
FB061	1-469-116-21	FERRITE	0uH		
FB063	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB065	1-469-116-21	FERRITE	0uH		
FB067	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB069	1-469-116-21	FERRITE	0uH		
FB071	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB073	1-469-116-21	FERRITE	0uH		
FB075	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
FB077	1-469-116-21	FERRITE	0uH		
FB078	1-216-801-11	METAL CHIP	22	5%	1/16W
FB080	1-216-801-11	METAL CHIP	22	5%	1/16W
FB081	1-216-801-11	METAL CHIP	22	5%	1/16W
FB083	1-216-801-11	METAL CHIP	22	5%	1/16W
FB084	1-216-801-11	METAL CHIP	22	5%	1/16W
FB085	1-216-801-11	METAL CHIP	22	5%	1/16W
FB087	1-216-801-11	METAL CHIP	22	5%	1/16W
FB088	1-216-801-11	METAL CHIP	22	5%	1/16W
FB090	1-469-116-21	FERRITE	0uH		
FB105	1-469-324-21	FERRITE	0uH		
FB106	1-469-324-21	FERRITE	0uH		
		< FILTER >			
FL001	1-234-177-21	FILTER, CHIP EMI			
FL002	1-234-177-21	FILTER, CHIP EMI			
FL003	1-233-893-21	FILTER, CHIP EMI			
FL004	1-233-893-21	FILTER, CHIP EMI			
FL005	1-234-177-21	FILTER, CHIP EMI			
FL006	1-234-177-21	FILTER, CHIP EMI			
FL008	1-234-177-21	FILTER, CHIP EMI			
FL009	1-234-177-21	FILTER, CHIP EMI			
FL010	1-234-177-21	FILTER, CHIP EMI			
FL014	1-234-177-21	FILTER, CHIP EMI			

Ref. No.	Part No.	Description	Remark
FL015	1-234-177-21	FILTER, CHIP EMI	
FL016	1-234-177-21	FILTER, CHIP EMI	
FL202	1-234-177-21	FILTER, CHIP EMI	
FL203	1-234-177-21	FILTER, CHIP EMI	
FL204	1-234-177-21	FILTER, CHIP EMI	
FL205	1-234-177-21	FILTER, CHIP EMI	
FL301	1-234-177-21	FILTER, CHIP EMI	
FL302	1-234-177-21	FILTER, CHIP EMI	
FL303	1-234-177-21	FILTER, CHIP EMI	
FL401	1-234-177-21	FILTER, CHIP EMI	
FL402	1-234-177-21	FILTER, CHIP EMI	
FL403	1-234-177-21	FILTER, CHIP EMI	
FL404	1-234-177-21	FILTER, CHIP EMI	
FL405	1-234-177-21	FILTER, CHIP EMI	
FL502	1-234-177-21	FILTER, CHIP EMI	
FL601	1-234-177-21	FILTER, CHIP EMI	
FL701	1-234-177-21	FILTER, CHIP EMI	
FL904	1-234-177-21	FILTER, CHIP EMI	
		< IC >	
IC001	8-759-594-91	IC SM8701AM-E2	
IC003	8-759-531-92	IC TC7WH04FU (TE12R)	
IC004	8-759-531-92	IC TC7WH04FU (TE12R)	
IC005	8-759-486-55	IC NJM2370U33-TE2	
IC201	8-759-469-25	IC AK6440AF-E2	
IC202	8-759-599-39	IC MB91101APFV-G-BND	
IC203	8-759-580-60	IC SN74AHCT08PWR	
IC204	8-759-573-65	IC IDT71V016S20PHAU-TL	
IC205	8-759-599-88	IC MBM29LV160B-290A-10 (HK, SP)	
IC205	8-759-599-89	IC MBM29LV160B-290B-10 (AUS, E32)	
IC206	8-759-644-27	IC MR27V1602D-27MAZ060 (CED, UK)	
IC207	8-759-427-92	IC PST9126NL	
IC302	8-759-486-55	IC NJM2370U33-TE2	
IC303	8-759-567-27	IC CXD8784R	
IC304	8-759-567-35	IC KM416V1200CT-L6T	
IC401	8-752-398-60	IC CXD1930BQ	
IC402	8-759-567-34	IC KM416S1020CT-G10T	
IC403	8-759-567-34	IC KM416S1020CT-G10T	
IC404	8-759-486-55	IC NJM2370U33-TE2	
IC501	8-752-400-43	IC CXD1901AR	
IC601	8-759-567-30	IC CXD8788Q	
IC701	8-759-598-87	IC CXD8791AQ	
IC702	8-759-337-40	IC NJM2904V (TE2)	
IC801	8-759-522-13	IC BA5981FP-E2	
IC802	8-759-567-26	IC BA5983FP-E2	
IC803	8-759-338-78	IC BA10324AFV-E2	
IC902	8-759-572-26	IC CXD8799N-T2	
IC904	8-759-052-52	IC BA178M05FP-E2	
IC907	8-759-572-26	IC CXD8799N-T2	
		< COIL >	
L001	1-414-754-11	INDUCTOR 10uH	
L402	1-414-754-11	INDUCTOR 10uH	
		< TRANSISTOR >	
Q801	8-729-015-74	TRANSISTOR UN5111-TX	
Q802	8-729-230-63	TRANSISTOR 2SD1819A-QRS-TX	
Q803	8-729-230-63	TRANSISTOR 2SD1819A-QRS-TX	

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R001	1-216-833-91	RES, CHIP	10K	5%	1/16W
R002	1-216-833-91	RES, CHIP	10K	5%	1/16W
R003	1-216-833-91	RES, CHIP	10K	5%	1/16W
R004	1-216-821-11	METAL CHIP	1K	5%	1/16W
R005	1-216-821-11	METAL CHIP	1K	5%	1/16W
R006	1-216-821-11	METAL CHIP	1K	5%	1/16W
R007	1-216-864-11	METAL CHIP	0	5%	1/16W
R009	1-216-864-11	METAL CHIP	0	5%	1/16W
R010	1-216-801-11	METAL CHIP	22	5%	1/16W
R014	1-216-801-11	METAL CHIP	22	5%	1/16W
R030	1-216-821-11	METAL CHIP	1K	5%	1/16W
R035	1-216-833-91	RES, CHIP	10K	5%	1/16W
R036	1-216-821-11	METAL CHIP	1K	5%	1/16W
R037	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R044	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R045	1-216-833-91	RES, CHIP	10K	5%	1/16W
R053	1-216-833-91	RES, CHIP	10K	5%	1/16W
R202	1-216-801-11	METAL CHIP	22	5%	1/16W
R203	1-216-833-91	RES, CHIP	10K	5%	1/16W
R204	1-216-833-91	RES, CHIP	10K	5%	1/16W
R205	1-216-845-11	METAL CHIP	100K	5%	1/16W
R206	1-216-845-11	METAL CHIP	100K	5%	1/16W
R207	1-216-833-91	RES, CHIP	10K	5%	1/16W
R212	1-216-864-11	METAL CHIP	0	5%	1/16W
R213	1-216-801-11	METAL CHIP	22	5%	1/16W
R217	1-216-833-91	RES, CHIP	10K	5%	1/16W
R222	1-216-833-91	RES, CHIP	10K	5%	1/16W
R223	1-216-833-91	RES, CHIP	10K	5%	1/16W
R225	1-216-833-91	RES, CHIP	10K	5%	1/16W
R227	1-216-813-11	METAL CHIP	220	5%	1/16W
R228	1-216-813-11	METAL CHIP	220	5%	1/16W
R229	1-216-813-11	METAL CHIP	220	5%	1/16W
R230	1-216-813-11	METAL CHIP	220	5%	1/16W
R231	1-216-813-11	METAL CHIP	220	5%	1/16W
R232	1-216-813-11	METAL CHIP	220	5%	1/16W
R235	1-216-864-11	METAL CHIP	0	5%	1/16W
R237	1-216-230-00	RES, CHIP	22K	5%	1/8W (AUS)
R237	1-216-238-91	RES, CHIP	47K	5%	1/8W (EXCEPT HK, SP, AUS)
R237	1-216-246-00	RES, CHIP	100K	5%	1/8W (HK, SP)
R238	1-216-200-11	RES, CHIP	1.2K	5%	1/8W
R239	1-216-230-00	RES, CHIP	22K	5%	1/8W (AUS)
R239	1-216-238-91	RES, CHIP	47K	5%	1/8W (HK, SP)
R239	1-216-246-00	RES, CHIP	100K	5%	1/8W (EXCEPT HK, SP, AUS)
R240	1-216-230-00	RES, CHIP	22K	5%	1/8W (AUS)
R240	1-216-238-91	RES, CHIP	47K	5%	1/8W (EXCEPT HK, SP, AUS)
R240	1-216-246-00	RES, CHIP	100K	5%	1/8W (HK, SP)
R241	1-216-200-11	RES, CHIP	1.2K	5%	1/8W
R305	1-218-879-11	METAL CHIP	22K	0.5%	1/16W
R306	1-218-831-11	METAL CHIP	220	0.5%	1/16W
R307	1-218-883-11	METAL CHIP	33K	0.5%	1/16W
R308	1-216-825-11	METAL CHIP	2.2K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R309	1-216-838-11	METAL CHIP	27K	5%	1/16W
R310	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R313	1-216-833-91	RES, CHIP	10K	5%	1/16W
R314	1-216-833-91	RES, CHIP	10K	5%	1/16W
R315	1-216-833-91	RES, CHIP	10K	5%	1/16W
R316	1-218-855-11	METAL CHIP	2.2K	0.5%	1/16W
R317	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R318	1-216-849-11	METAL CHIP	220K	5%	1/16W
R319	1-216-831-11	METAL CHIP	6.8K	5%	1/16W
R320	1-218-853-11	METAL CHIP	1.8K	0.5%	1/16W
R321	1-218-847-11	METAL CHIP	1K	0.5%	1/16W
R322	1-218-871-11	METAL CHIP	10K	0.5%	1/16W
R323	1-216-833-91	RES, CHIP	10K	5%	1/16W
R324	1-216-833-91	RES, CHIP	10K	5%	1/16W
R325	1-216-833-91	RES, CHIP	10K	5%	1/16W
R326	1-216-833-91	RES, CHIP	10K	5%	1/16W
R327	1-216-833-91	RES, CHIP	10K	5%	1/16W
R328	1-216-833-91	RES, CHIP	10K	5%	1/16W
R329	1-216-833-91	RES, CHIP	10K	5%	1/16W
R330	1-216-833-91	RES, CHIP	10K	5%	1/16W
R331	1-216-833-91	RES, CHIP	10K	5%	1/16W
R332	1-216-833-91	RES, CHIP	10K	5%	1/16W
R337	1-216-809-11	METAL CHIP	100	5%	1/16W
R338	1-216-833-91	RES, CHIP	10K	5%	1/16W
R339	1-216-833-91	RES, CHIP	10K	5%	1/16W
R340	1-216-833-91	RES, CHIP	10K	5%	1/16W
R341	1-216-809-11	METAL CHIP	100	5%	1/16W
R403	1-216-833-91	RES, CHIP	10K	5%	1/16W
R404	1-216-864-11	METAL CHIP	0	5%	1/16W
R405	1-216-827-11	METAL CHIP	3.3K	5%	1/16W
R406	1-216-822-11	METAL CHIP	1.2K	5%	1/16W
R407	1-216-833-91	RES, CHIP	10K	5%	1/16W
R409	1-216-864-11	METAL CHIP	0	5%	1/16W
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W
R411	1-216-833-91	RES, CHIP	10K	5%	1/16W
R412	1-216-809-11	METAL CHIP	100	5%	1/16W
R426	1-216-813-11	METAL CHIP	220	5%	1/16W
R427	1-216-813-11	METAL CHIP	220	5%	1/16W
R428	1-216-813-11	METAL CHIP	220	5%	1/16W
R429	1-216-813-11	METAL CHIP	220	5%	1/16W
R430	1-216-813-11	METAL CHIP	220	5%	1/16W
R431	1-216-813-11	METAL CHIP	220	5%	1/16W
R519	1-216-809-11	METAL CHIP	100	5%	1/16W
R520	1-216-833-91	RES, CHIP	10K	5%	1/16W
R521	1-216-833-91	RES, CHIP	10K	5%	1/16W
R522	1-216-833-91	RES, CHIP	10K	5%	1/16W
R527	1-216-833-91	RES, CHIP	10K	5%	1/16W
R528	1-216-833-91	RES, CHIP	10K	5%	1/16W
R530	1-216-864-11	METAL CHIP	0	5%	1/16W
R537	1-216-806-11	RES, CHIP	56	5%	1/16W
R539	1-216-864-11	METAL CHIP	0	5%	1/16W
R540	1-216-864-11	METAL CHIP	0	5%	1/16W
R541	1-216-864-11	METAL CHIP	0	5%	1/16W
R543	1-216-864-11	METAL CHIP	0	5%	1/16W
R544	1-216-864-11	METAL CHIP	0	5%	1/16W
R605	1-216-833-91	RES, CHIP	10K	5%	1/16W
R606	1-216-833-91	RES, CHIP	10K	5%	1/16W
R630	1-216-833-91	RES, CHIP	10K	5%	1/16W
R631	1-216-833-91	RES, CHIP	10K	5%	1/16W
R632	1-216-833-91	RES, CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R633	1-216-833-91	RES, CHIP	10K	5%	1/16W
R634	1-216-833-91	RES, CHIP	10K	5%	1/16W
R635	1-216-833-91	RES, CHIP	10K	5%	1/16W
R636	1-216-815-11	METAL CHIP	330	5%	1/16W
R637	1-216-809-11	METAL CHIP	100	5%	1/16W
R638	1-216-809-11	METAL CHIP	100	5%	1/16W
R639	1-216-809-11	METAL CHIP	100	5%	1/16W
R640	1-216-809-11	METAL CHIP	100	5%	1/16W
R641	1-216-809-11	METAL CHIP	100	5%	1/16W
R642	1-216-809-11	METAL CHIP	100	5%	1/16W
R643	1-216-815-11	METAL CHIP	330	5%	1/16W
R647	1-216-833-91	RES, CHIP	10K	5%	1/16W
R701	1-216-805-11	METAL CHIP	47	5%	1/16W
R702	1-216-817-11	METAL CHIP	470	5%	1/16W
R703	1-216-817-11	METAL CHIP	470	5%	1/16W
R704	1-216-817-11	METAL CHIP	470	5%	1/16W
R705	1-216-817-11	METAL CHIP	470	5%	1/16W
R706	1-216-821-11	METAL CHIP	1K	5%	1/16W
R707	1-216-844-11	METAL CHIP	82K	5%	1/16W
R708	1-216-844-11	METAL CHIP	82K	5%	1/16W
R709	1-216-844-11	METAL CHIP	82K	5%	1/16W
R710	1-216-844-11	METAL CHIP	82K	5%	1/16W
R711	1-216-833-91	RES, CHIP	10K	5%	1/16W
R712	1-216-839-11	METAL CHIP	33K	5%	1/16W
R720	1-216-821-11	METAL CHIP	1K	5%	1/16W
R721	1-216-821-11	METAL CHIP	1K	5%	1/16W
R722	1-216-801-11	METAL CHIP	22	5%	1/16W
R748	1-216-833-91	RES, CHIP	10K	5%	1/16W
R751	1-216-821-11	METAL CHIP	1K	5%	1/16W
R752	1-216-821-11	METAL CHIP	1K	5%	1/16W
R755	1-216-833-91	RES, CHIP	10K	5%	1/16W
R757	1-216-864-11	METAL CHIP	0	5%	1/16W
R758	1-216-864-11	METAL CHIP	0	5%	1/16W
R801	1-216-841-11	METAL CHIP	47K	5%	1/16W
R802	1-216-841-11	METAL CHIP	47K	5%	1/16W
R803	1-216-841-11	METAL CHIP	47K	5%	1/16W
R804	1-216-841-11	METAL CHIP	47K	5%	1/16W
R805	1-216-840-11	METAL CHIP	39K	5%	1/16W
R806	1-216-840-11	METAL CHIP	39K	5%	1/16W
R807	1-216-835-11	METAL CHIP	15K	5%	1/16W
R808	1-216-835-11	METAL CHIP	15K	5%	1/16W
R809	1-216-844-11	METAL CHIP	82K	5%	1/16W
R810	1-216-844-11	METAL CHIP	82K	5%	1/16W
R811	1-218-907-11	METAL CHIP	330K	0.5%	1/16W
R812	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R813	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R814	1-218-907-11	METAL CHIP	330K	0.5%	1/16W
R815	1-216-836-11	METAL CHIP	18K	5%	1/16W
R816	1-216-845-11	METAL CHIP	100K	5%	1/16W
R817	1-216-852-11	METAL CHIP	390K	5%	1/16W
R818	1-216-852-11	METAL CHIP	390K	5%	1/16W
R819	1-216-849-11	METAL CHIP	220K	5%	1/16W
R820	1-216-851-11	METAL CHIP	330K	5%	1/16W
R821	1-216-840-11	METAL CHIP	39K	5%	1/16W
R822	1-216-845-11	METAL CHIP	100K	5%	1/16W
R823	1-216-833-91	RES, CHIP	10K	5%	1/16W
R824	1-216-833-91	RES, CHIP	10K	5%	1/16W
R825	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R826	1-216-830-11	METAL CHIP	5.6K	5%	1/16W
R827	1-216-851-11	METAL CHIP	330K	5%	1/16W

Ref. No.	Part No.	Description			Remark
R828	1-216-837-11	METAL CHIP	22K	5%	1/16W
R829	1-216-837-11	METAL CHIP	22K	5%	1/16W
R831	1-216-833-91	RES, CHIP	10K	5%	1/16W
R832	1-216-833-91	RES, CHIP	10K	5%	1/16W
R834	1-216-847-11	METAL CHIP	150K	5%	1/16W
R835	1-216-847-11	METAL CHIP	150K	5%	1/16W
R836	1-216-847-11	METAL CHIP	150K	5%	1/16W
R837	1-216-844-11	METAL CHIP	82K	5%	1/16W
R838	1-216-848-11	METAL CHIP	180K	5%	1/16W
R839	1-216-848-11	METAL CHIP	180K	5%	1/16W
R840	1-216-848-11	METAL CHIP	180K	5%	1/16W
R841	1-216-843-11	METAL CHIP	68K	5%	1/16W
R842	1-216-844-11	METAL CHIP	82K	5%	1/16W
R843	1-216-844-11	METAL CHIP	82K	5%	1/16W
R844	1-216-843-11	METAL CHIP	68K	5%	1/16W
R845	1-216-843-11	METAL CHIP	68K	5%	1/16W
R846	1-216-841-11	METAL CHIP	47K	5%	1/16W
R847	1-216-296-91	SHORT	0		
R851	1-216-833-91	RES, CHIP	10K	5%	1/16W
R852	1-216-833-91	RES, CHIP	10K	5%	1/16W
R853	1-216-833-91	RES, CHIP	10K	5%	1/16W
R854	1-216-833-91	RES, CHIP	10K	5%	1/16W
R855	1-216-834-11	METAL CHIP	12K	5%	1/16W
R856	1-216-836-11	METAL CHIP	18K	5%	1/16W
R857	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R858	1-218-899-11	METAL CHIP	150K	0.5%	1/16W
R859	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R860	1-218-889-11	METAL CHIP	56K	0.5%	1/16W
R861	1-216-296-91	SHORT	0		
R864	1-216-138-00	METAL CHIP	3.3	5%	1/8W
R865	1-216-833-91	RES, CHIP	10K	5%	1/16W
R866	1-216-833-91	RES, CHIP	10K	5%	1/16W
R867	1-216-833-91	RES, CHIP	10K	5%	1/16W
R868	1-216-833-91	RES, CHIP	10K	5%	1/16W
R869	1-216-833-91	RES, CHIP	10K	5%	1/16W
R870	1-216-815-11	METAL CHIP	330	5%	1/16W
R871	1-216-817-11	METAL CHIP	470	5%	1/16W
R872	1-216-815-11	METAL CHIP	330	5%	1/16W
R873	1-216-821-11	METAL CHIP	1K	5%	1/16W
R915	1-216-809-11	METAL CHIP	100	5%	1/16W
R918	1-216-809-11	METAL CHIP	100	5%	1/16W
		< COMPOSITION CIRCUIT BLOCK >			
* RB201	1-233-270-11	NETWORK, RES (8 GANG)	10K		
* RB202	1-233-270-11	NETWORK, RES (8 GANG)	10K		
* RB203	1-233-270-11	NETWORK, RES (8 GANG)	10K		
* RB204	1-233-270-11	NETWORK, RES (8 GANG)	10K		
* RB402	1-233-270-11	NETWORK, RES (8 GANG)	10K		
* RB601	1-233-270-11	NETWORK, RES (8 GANG)	10K		
		< VARIABLE RESISTOR >			
RV401	1-223-583-11	RES, ADJ, CARBON	1K		
		< VIBRATOR >			
X001	1-781-188-21	OSCILLATOR, CRYSTAL (27MHz)			
X201	1-781-185-21	VIBRATOR, CERAMIC (12.5MHz)			

Ref. No.	Part No.	Description	Remark
*	A-6065-380-A	SW-332 BOARD, COMPLETE	
		**********	
		(Ref.No. 2,000 Series)	
		< CONNECTOR >	
CN101	1-793-579-21	CONNECTOR, FPC	
* CN102	1-770-619-11	PIN, CONNECTOR 2P	
		< DIODE >	
D101	8-719-988-61	DIODE 1SS355TE-17	
		< SWITCH >	
S101	1-762-594-61	SWITCH, PUSH (1 KEY) (CHUCK SENSOR)	
S102	1-572-688-11	SWITCH, PUSH (1 KEY) (CHUCK SENSOR)	
S103	1-572-688-11	SWITCH, PUSH (1 KEY) (CHUCK SENSOR)	
*	A-6065-381-A	TK-55 BOARD, COMPLETE	
		**********	
		(Ref.No. 2,000 Series)	
		< CAPACITOR >	
C004	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C005	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C006	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C007	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C008	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C009	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	
C010	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C011	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C012	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C013	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C014	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C015	1-162-919-11	CERAMIC CHIP 22PF 5% 50V	
C016	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C017	1-164-172-11	CERAMIC CHIP 0.0056uF 10% 25V	
C018	1-164-739-11	CERAMIC CHIP 560PF 5% 50V	
C019	1-164-172-11	CERAMIC CHIP 0.0056uF 10% 25V	
C020	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C021	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C022	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C023	1-165-176-11	CERAMIC CHIP 0.047uF 10% 16V	
C024	1-164-730-11	CERAMIC CHIP 0.0012uF 10% 50V	
C025	1-165-176-11	CERAMIC CHIP 0.047uF 10% 16V	
C026	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C027	1-164-217-11	CERAMIC CHIP 150PF 5% 50V	
C028	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C029	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C030	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C031	1-124-779-00	ELECT CHIP 10uF 20% 16V	
C032	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C033	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C034	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C035	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C036	1-165-176-11	CERAMIC CHIP 0.047uF 10% 16V	
C037	1-164-739-11	CERAMIC CHIP 560PF 5% 50V	
C038	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C039	1-107-826-91	CERAMIC CHIP 0.1uF 10% 16V	
C040	1-162-969-11	CERAMIC CHIP 0.0068uF 10% 25V	
C041	1-162-966-11	CERAMIC CHIP 0.0022uF 10% 50V	

Ref. No.	Part No.	Description			Remark
		< CONNECTOR >			
CN001	1-785-700-21	CONNECTOR, FPC (ZIF) 23P			
CN002	1-566-529-11	CONNECTOR, FPC (ZIF) 13P			
CN003	1-785-699-21	CONNECTOR, FFC/FPC 18P			
CN004	1-785-699-21	CONNECTOR, FFC/FPC 18P			
* CN005	1-580-789-21	PIN, CONNECTOR (SMD) 6P			
* CN006	1-580-055-21	PIN, CONNECTOR (SMD) 2P			
* CN007	1-580-055-21	PIN, CONNECTOR (SMD) 2P			
		< DIODE >			
D003	8-719-988-61	DIODE 1SS355TE-17			
		< IC >			
IC001	8-759-567-24	IC SSI33P3722			
		< COIL >			
L001	1-412-031-11	INDUCTOR CHIP 47uH			
		< TRANSISTOR >			
Q001	8-729-903-46	TRANSISTOR	2SB1132-T100-QR		
Q002	8-729-015-76	TRANSISTOR	UN5211-TX		
		< RESISTOR >			
R001	1-216-815-11	METAL CHIP	330	5%	1/16W
R002	1-216-809-11	METAL CHIP	100	5%	1/16W
R003	1-216-809-11	METAL CHIP	100	5%	1/16W
R004	1-216-837-11	METAL CHIP	22K	5%	1/16W
R005	1-216-013-00	METAL CHIP	33	5%	1/10W
R006	1-216-013-00	METAL CHIP	33	5%	1/10W
R007	1-216-841-11	METAL CHIP	47K	5%	1/16W
R008	1-216-797-11	METAL CHIP	10	5%	1/16W
R009	1-216-834-11	METAL CHIP	12K	5%	1/16W
R010	1-216-833-91	RES, CHIP	10K	5%	1/16W
R012	1-216-864-11	METAL CHIP	0	5%	1/16W
R014	1-216-864-11	METAL CHIP	0	5%	1/16W
R015	1-216-833-91	RES, CHIP	10K	5%	1/16W
R016	1-216-833-91	RES, CHIP	10K	5%	1/16W
R017	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R018	1-216-833-91	RES, CHIP	10K	5%	1/16W
R022	1-216-811-11	METAL CHIP	150	5%	1/16W
R023	1-216-820-11	METAL CHIP	820	5%	1/16W
R025	1-216-813-11	METAL CHIP	220	5%	1/16W
R026	1-216-864-11	METAL CHIP	0	5%	1/16W
R029	1-216-861-11	METAL CHIP	2.2M	5%	1/16W

MISCELLANEOUS
****

52	1-791-670-11	CABLE, FLEXIBLE FLAT (FMT-27)
54	1-791-668-11	CABLE, FLEXIBLE FLAT (FMA-17)
55	1-791-669-11	CABLE, FLEXIBLE FLAT (FMA-18)
57	1-791-672-11	CABLE, FLEXIBLE FLAT (FMS-12)
59	1-791-671-11	CABLE, FLEXIBLE FLAT (FMF-38)
66	1-543-950-11	CORE, FERRITE
167	1-960-020-11	HARNESS (ST-117)
M001	A-4608-416-A	MOTOR ASSY, LD (LOADING)

Ref. No.	Part No.	Description	Remark
S001	1-570-771-21	SWITCH (CHUCK SENSOR)	

ACCESSORIES & PACKING MATERIALS
****

	1-418-508-21	COMMANDER, STANDARD (RMT-D109O/S) (EXCEPT HK, SP)	
	1-418-508-31	COMMANDER, STANDARD (RMT-D109E/S) (HK, SP)	
⚠	1-418-676-11	ADAPTOR, AC	
	1-575-334-11	CORD, CONNECTION (STEREO AV CABLE 1.5m)	
	1-575-335-21	CORD, CONNECTION (S-VIDEO CABLE 1.5m)	
⚠	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK, HK)	
⚠	1-791-638-11	CORD, POWER (EXCEPT AUS)	
⚠	1-791-667-11	CORD, POWER (AUS)	
⚠	1-793-669-11	ADAPTOR, CONVERSION (CED, E32, UK)	
	3-053-633-01	COVER, BATTERY	
	3-058-025-01	SCREW, COIN	
	3-867-780-11	MANUAL, INSTRUCTION (ENGLISH) (CED, E32, UK, AUS)	
	3-867-780-21	MANUAL, INSTRUCTION (FRENCH, GERMAN) (CED, E32)	
	3-867-780-31	MANUAL, INSTRUCTION (ITALIAN, DUTCH) (CED, E32)	
	3-867-780-41	MANUAL, INSTRUCTION (SPANISH, PORTUGUESE) (CED)	
	3-867-780-51	MANUAL, INSTRUCTION (DANISH, FINNISH) (CED)	
	3-867-780-61	MANUAL, INSTRUCTION (SWEDISH, NORWEGIAN) (CED)	
	3-867-788-11	MANUAL, INSTRUCTION (ENGLISH) (HK, SP)	
	3-867-788-21	MANUAL, INSTRUCTION (CHINESE) (HK)	
	3-867-788-31	MANUAL, INSTRUCTION (CHINESE)(SP)	
	X-3949-960-1	STAND ASSY	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

9-921-740-11

Sony Corporation
Home Video Company

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